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ABSTRACT

The report of general educational policy and planning in Austria was undertaken by the Austrian Ministry of Education. It was prepared for the Educational Investment and Planning Programme of the Organisation for Economic Cooperation and Development (OECD) Committee for Scientific and Technical Personnel. The document is a technical report, based on data about the dynamics of the internal operation of the educational system and the relationship of the educational system to the national economy, which views the Austrian educational system in its total social and economic context. The report contains discussion by chapter of (1) the Austrian school; (2) projected flows through the Austrian educational system, 1965-1975; (3) projections up to 1980 about skilled manpower requirements in a changing economy; (4) the social demand for education, 1965-1975; (5) the resources needed to accommodate the projected expansion in enrollments; and (6) major policy indications for Austrian education. Appendices containing many tables, graphs, charts, and diagrams conclude the document. (Author/ND)

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EDUCATIONAL POLICY AND PLANNING

AUSTRIA

SO 009291

DIRECTORATE FOR SCIENTIFIC AFFAIRS
ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT

PARIS 1968

EDUCATIONAL POLICY AND PLANNING

AUSTRIA

DIRECTORATE FOR SCIENTIFIC AFFAIRS
ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT

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FOREWORD

An important aspect of the work undertaken under the Educational Investment and Planning Programme (EIP) of the OECD Committee for Scientific and Technical Personnel since its beginning in 1963, has been the preparation by participating countries of general educational policy and planning reports. Such reports have so far been completed or are in the process of preparation for at least eight Member countries. Taken together with the national reports of the six Member countries which were prepared under the parallel Mediterranean Regional Project, they provide an indication of the growing concern common to most Member countries for a systematic approach to educational policy and planning in order to meet social and economic needs.

Each of the general policy and planning reports reflects the specific situation with respect to educational development problems in the country concerned. They are national products, prepared by planning authorities, usually newly established, in each participating country. The role of OECD has been to assist in this work in the establishment of a conceptual framework and in the exchange of ideas and techniques for educational development planning which takes place among the country planning authorities participating in the EIP Programme. Thus, these country reports do have some common characteristics. In particular, they are technical documents in that they are distinguished by an approach to the policy issues in educational development from the viewpoint of planning. This means that these reports take a comprehensive view of the educational system in its total social and economic context. Furthermore, they are based on an effort to gather and analyse data on the educational system and the dynamics of its internal operation and of its relationships to the economy. In short, these reports make a first effort at a global, scientific approach to the major problems of educational development in the country in question.

The Austrian report presented here is a good example of this kind of effort. It is worthy of note that what began as a task, assumed by an ad hoc group for the Austrian Ministry of Education (the OECD/EIP Planning Bureau), has led to the setting up of a permanent unit of the Austrian Ministry of Education, and that, as a consequence, the Ministry intends to continue the process of educational development planning which increasingly involves all the major sectors of the educational system. It is hoped that the publication of this report will prove useful to other countries which are faced with similar problems of educational planning, both at the institutional and the substantive levels.

Thorkil Kristensen
Secretary-General of the OECD

PREFACE

Following upon its active participation in the OECD's Washington Conference on Educational Development Policy in 1961, the Austrian government readily took up the offer to join the Educational Investment and Planning Programme, OECD's co-operative action in this field. This action, and the subsequent programme which arose from it, were directly in line with developments in Austrian education during this period. The 1962 School Organisation Act virtually called for the creation of a new planning mechanism to co-ordinate the new elements which it had introduced into the educational system.

However, this process has been greatly facilitated by the fruitful co-operation established with the other Member countries of the OECD within the framework of the EIP Programme. In the process of this co-operation we have been encouraged to support a growing effort in scientific investigation into the status, development trends and major problems in Austrian education and have been further encouraged to establish a permanent governmental unit, the Department of Planning and Research in the Ministry of Education (Wissenschaftliche Abteilung des Bundesministeriums für Unterricht), to assume primary responsibility for this work.

The scientific approach to educational development sees the educational system within the context of the total development of the society in the country involved. The contents of this report have developed over a period of almost three years, during which time sections of it and some of its background studies have been made available for public and official critique in Austria. Furthermore, a completed draft was examined within the framework of the national planning directors group of the OECD/EIP Programme here in Vienna in September, 1966, and these meetings, for which I had the pleasure and the honour to serve as host, were attended by a broad representation of the senior Austrian authorities for education. Thus, the scientific findings in this report have become part of the deliberations among educational authorities in a progressive process even before its final publication, and it is my conviction that the establishment of this process of scientific self-examination for education is at least as important as the major reports such as this one.

Thus a German version of this report, being widely distributed among the school authorities and the general Austrian public, already carries forward some of its aspects in further detail, which reflects the assignment of the newly-established Department of Planning and Research in the Ministry. Its role is to garner and examine an increasing flow of data, to perform and initiate scientific studies and to check on the actual performance of the educational system relative to its projected targets and plans.

This has been a complex, technical operation which has required, and will continue to require, assistance. Thus, it is my pleasure to express our deep appreciation to the OECD, particularly its Directorate for Scientific Affairs, for their invaluable contribution to this work which has left its permanent mark on educational planning in Austria. Deep thanks are also due to the representatives and experts of various countries participating in the EIP Programme for their collaboration throughout the various stages of the work represented in this report. If this report is in any way useful to other countries attempting new work in this field, it will constitute some partial repayment for this international contribution.

Dr. Theodor Piffl-Perćević,
Minister of Education

TERMS OF REFERENCE

(from: Agreement between the Organisation for Economic Co-Operation and Development and the Federal Government of the Republic of Austria, 30th December, 1963).

"Article 1

Purpose of the Project

The purpose of the Project is to prepare a programme for the expansion of educational facilities in Austria up to 1975 (hereinafter called the "Programme") and to make available the experience gained through the preparation of this Programme to other Member countries of the Organisation.

Article 2

Method of Implementation

a) The Programme provided for in Article 1 shall be based on careful studies of future national and international economic and social trends.

b) The terms of reference for these studies shall be as follows:

(i) An examination of the educational system of Austria in relation to the present requirements, including the implications of international conventions and recommendations in the educational field;

(ii) An assessment of the overall needs for skilled manpower - according to field of study and level of skill - for the next 15 years based on assumptions concerning trends in economic and demographic trends and the experience of other countries;

(iii) An assessment of future social demand for educational facilities at different levels based on expected future trends and international experience, including an examination of existing and expected bottlenecks;

(iv) Estimates of future enrolments at different levels of education, and by subject of specialisation, according to the assumptions mentioned above;

(v) Interpretations of estimated enrolment figures in terms of the expansion of educational resources, i.e. buildings, equipment, teachers, etc., taking into account possible improvements;

(vi) Evaluations of the expenditure entailed by the expansion of educational resources - the evaluations should be expressed in relation to macro-economic data, such as Gross National Product and volume of investment.

(vii) Consideration of research and administrative arrangements necessary to ensure the continuous review of the position in the light of changing circumstances in the field covered by these studies. This should also include recommendations concerning the nature and extent of the additional statistical data to be collected, and the methods and frequency of such collection.

c) The more detailed formulation of the terms of reference shall be subject to consultation between the two Parties during the implementation of the Project."

THE AUSTRIAN OECD-EIP PROJECT

The Steering Committee:

Chairman:

Dr. Theodor Piffl-Perćević, Federal Minister of Education

First Deputy Chairman:

Dr. Ludwig Wohlgemuth, Director General, Ministry of Education

Second Deputy Chairman:

Dr. Franz Hoyer, Director General, Ministry of Education

Third Deputy Chairman:

Dipl.Ing. Georg Golser, Director, Ministry of Education

Special studies contributed to the Project:

"Reserves of Mental Abilities in the Burgenland",
Psycho-Pedagogical Service of Austria, Vienna, 1965

"Demand for Accommodation for Primary, Upper Primary and Special Schools"
Dipl. Ing. Karl Schlesinger

"Demand for Accommodation for Intermediate Schools and Secondary Schools giving Access to Higher Education", Dr. Franz Loicht and Dr. Johann Czemetschka

"Social Demand for Education in Austria", Dr. Kurt Freisitzer

"Forecasting the Number of Students at Austrian Institutions of Higher Education to 1975",
Dr. Georg Wieser

"Basic Demographic and Educational Statistics", Dr. Franz Haupt.

THE PROJECT TEAM

Ministerialrat Dr. Hans Nowotny, Federal Ministry of Education for Austria, Director.

Dr. Franz Beer, The Ministry of Education.

Dr. Karl Grohmann, The Ministry of Education.

Dr. Joseph Steindl, Institute for Economic Research, Vienna.

INTRODUCTION

The following study has been undertaken and shaped in response to a significant set of historical circumstances. The Austrian school system was radically reformed by the School Organisation Act of 1962 which brought an end to an eventful chapter in the history of education in Austria. The prolonged and laborious efforts to reorganise the Austrian school system may well be included among the great achievements of Austrian reconstruction after World War II. The legal uncertainty prevailing in some spheres of educational life, brought about by civil war, foreign rule and occupation, has now been removed. A firm legal foundation has been laid for a systematic development of the school system.

The year 1955 - the year in which Austria regained its national independence - marks the beginning of a period of greater economic security and increasing prosperity, and a steady increase in the birth rate. This social and demographic development, as well as certain provisions of the School Organisation Act 1962 - above all the extension of compulsory education and the limitation of the number of pupils per class - gave rise to inquiries into the prospective demand for teachers, school accommodation and funds. These inquiries aimed at a full survey of the present situation of Austrian educational institutions and the findings were published in the "1965 Report on Education". The present study, which was announced by the Minister of Education, Dr. Theodor Piffl-Perćević, in his preface to the 1965 Report, is intended to continue this work. However, the aim here is to investigate not only the effects of the new Education Act, but also of the probable course of the economic development on the educational system of Austria.

The present economic (as well as the social and cultural) developments in Europe have an increasing significance for Austria. The great European market is becoming an economic reality, and Austria's accommodation to this European market - whichever form this may take - is an absolutely vital challenge for Austria.

In bringing about this accommodation it will not only be a question of expanding and developing, in terms of an international division of labour, those branches of production for which conditions are most favourable in Austria. Rather, we shall have to catch up with the highly industrialised nations of Europe, which have already overtaken Austria in the field of rationalisation of production methods. This direction is illustrated by automation which is being only slowly introduced in Austria.

The changes in production methods likely to be brought about by such a rationalisation, and the consequences in terms of a transformation of the present manpower and occupational structure, bear careful observation because these changes in the economic field are closely interwoven with the educational system which trains the manpower required. Furthermore, it is also widely recognised how changes in production methods affect changes in the social structure. However, the significance of these changes for the educational system has not yet been generally recognised in Austria.

Austria is sharing in the general development of modern industrial society and its transformation of the occupational and social structure. The proportion of persons employed in agriculture is declining. The number of industrial workers is increasing, although this group, too, will probably decrease again as automation proceeds. On the other hand, the number of persons employed in the third or tertiary sector of the economy (trade and distribution of goods, transport, the servicing, repair and assembling industries, the hotel and catering industries, financial and credit institutions, the insurance business, education, tourism, etc., in short, all industries not engaged in production but rendering services) is strongly on the increase.

These developments mean that in agriculture a much smaller number of persons than hitherto have to produce as much or even more than before, and the machines replacing the agricultural labourer have to be operated by skilled workers. Today the farmer who wants to increase his production has to acquire knowledge approaching the level of an engineer or a college-trained agricultural expert.

Industry and trade, of course, move in the same direction of rationalisation of production methods requiring the proper training of the highly qualified labour. Skilled labour replaces the unskilled and a premium rests on those who can use both brains and hands, who not only operate the machines but also contribute to their improvement. Furthermore, industry needs people in a position to co-ordinate the different operational stages of an assembly process, whose training covers a whole set of related professional skills.

As regards the service-rendering sector it can be said that in a complex economy which offers society an increasing amount of goods and leisure-time, all intellectual occupations and professions show an upward trend. The exchange of goods and services has to be organised, and this sphere requires trained specialists and capable leaders. In such an economy people demand better care in all the social areas, including higher educational attainment for their children.

These few reflections reveal the enhanced demands made on our schools today. Compared with former times the task of the school has changed: today more than ever before it plays an economic role, for it is responsible for the training of the qualified manpower required by the modern economy. Every expansion of the economy increasingly depends on the type and degree of this educational training of the available manpower. As a consequence of this, the educational system of a country must be viewed from a new angle. It is no longer merely the "pedagogic province" of former times, more or less removed from the reality of every day life and pursuing autonomous educational aims. The value of these autonomous educational aims which exist independently of the needs of the economy, remains uncontested even today. However, education has also become an important factor in economic development; its significance is just as real as that of capital resources and the means of production.

In his opening speech at the Fifth Conference of the European Ministers of Education, Dr. Theodor Piffl-Perčević, the Austrian Federal Minister of Education, outlined this new role of the school in the modern world as follows:

> "The challenges which confront education, that is, the schools and the learned institutions in Europe and throughout the world, are becoming ever more complex and extensive. This is a result of the rapid development of science and technology in our times and the repercussion of this development on modern life. Increasingly, the school is

> becoming the decisive factor also for economic progress, for a progress which demands an extension of general education to all who can profit by it - that is, full use of all intellectual reserves - and which increasingly needs the all-round educated expert at the expense of the less educated. Today the economic potential of a country - and of our continent - depends just as much on the work done in the schools as on the natural resources and the organisational and political mastering of its economic problems. Thus, what matters most is that the educational system should adjust itself to the social and economic situation of today ... Owing to the general raising of the level of education and the intensified flow to the places of learning, the contemporary schools are faced with problems unknown in former times: the 'explosion scolaire' not only seems to be bursting the material frame of the school buildings, it also puts pressure on the internal organisation of the school system, which calls for a thorough revision of the traditional approaches."

Thus, the motivation underlying this report is that the circumstances today require an increase in the output and qualitative achievement of the upper school levels, and the time has come to determine what will be the extent of this increase. It has become absolutely necessary to express the developments described above in terms of numbers, e.g. to record statistically, over the last three decades, the decrease of manpower in the agricultural sector and the increase of the labour force in industry and trade as well as in the service-rendering industries. Furthermore, it is necessary to go on to forecast the future development of the trends indicated. What will be the future changes in the structure of the Austrian economy (the development in other highly industrialised countries may give an indication) and how will these changes affect the demand for highly qualified manpower dependent on them? In what way will the effects be felt of the growing social demand for higher education in the affluent society? Will the output of the Austrian schools to be expected for the next few years on the various levels of education suffice to cover the needs for an optimum development of the Austrian economy? To put it in terms of resources required for education over the next ten years in Austria, what is the demand for personnel, new buildings and funds in the entire field of education, in view of the requirements of a changing and expanding economy?

Conscious of the great responsibility borne by the educational authorities for the intellectual and economic existence of the Austrian nation,(1) the Austrian Federal Government decided towards the end of 1963 to initiate an investigation which should begin to provide answers to the above questions, and entered an agreement with the OECD (Organisation for Economic Co-operation and Development) dated December 30, 1963, to draft a "Pilot Study on the Long-Term Demand for Educational Facilities in Austria". The Federal Ministry of Education was entrusted with the task of carrying out this study whose terms of reference represented a new point of view for Austria in this field.

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(1) See the preface to the "1965 Report on Education" by the Federal Minister of Education, Dr. Theodor Piffl-Perčević. The extent of this responsibility becomes evident if we consider the fact that the training of university-educated people takes about 14 to 15 years from the time they enter secondary school in Austria and that an increase in the number of such people at a given time depends on measures taken long before. Omissions in this respect cannot subsequently be easily rectified

ACKNOWLEDGEMENTS

It is our pleasure to acknowledge the role of the O.E.C.D., and in particular its Directorate for Scientific Affairs, in this project. Members of the Secretariat who were directly involved in this work are too numerous to mention by name, but we wish to record our appreciation for their collective and constructive contribution as well as for their imaginative leadership and sympathetic understanding of Austria without which this programme could not have been made possible in the first place.

Beyond the O.E.C.D. Secretariat, the country representatives to the E.I.P. Programme have also played an essential part in this activity. The highest appreciation is due to Mr. Jack Embling, Deputy Secretary of State in the Education Ministry of the United Kingdom, who as chairman guided the E.I.P. group through its deliberations on this report. Furthermore, Mr. Martin O'Donoghue of Ireland, Mr. H. Veldkamp, Mr. Roel Ruiter and Mr. William Voster of the Netherlands have, together with Dr. A. Little, contributed the critique of country experts and colleagues in the field, lending the objectivity of outside opinion to our work and discussions. Special thanks are also due to my friend and former colleague Graham Atkinson for his valuable help during the eighteen months which he spent, under O.E.C.D. auspices, as a functional member of the E.I.P. team in Vienna.

Ministerialrat Dr. Hans Nowotny,
Head of Department of Planning and
Research, Ministry of Education of
Austria.

Chapter I

THE AUSTRIAN SCHOOL SYSTEM

A. Organisation and Aims of the Austrian Schools

1. Distribution of authority between Federal Government and provinces

Historically, the quest for a generally acceptable formula for distributing authority on educational matters between Federal and Provincial governments in Austria has been a long and difficult one. It would perhaps be useful, therefore, to trace here the principal steps which have marked that search for an agreed juridical foundation since the adoption of the Federal Constitution in 1920. The following historical outline is from the introduction to Dr. F. Jellouschek's "Handbook of Regulations for the General Schools".

> "When the Austrian Federal Constitution was drawn up in 1920 no final agreement was reached on the distribution of authority between the Federation and the Provinces with respect to schools, education and adult education. This was due partly to the ideological differences between the political parties and partly to the irreconcilable views of the centralists, on the one hand, and the federalists, on the other. In a transitional provision, the distribution of authority, as set forth in the Constitution of December 1867, and still in force at that time, was essentially upheld and was amended by the provision that regulations concerning the school system could, in most cases, be effected only by corresponding acts of the Federation and the Provinces.
>
> After the entry into force of the Federal Constitution the efforts to obtain a clear constitutional basis for the educational system were continued. Whereas in some fields of education a reform was effected in 1927, attempts to settle the basic constitutional problem failed. When the Constitution was amended in 1929, the Federal Government then in power tried to strengthen the influence of the Federation, at least in the executive field, by improving the position of the Federal Ministry of Education; however, this attempt also failed to yield the expected results, since in Article 102 a, which was finally included in the Federal Constitutional Act, the rights of the Federal Ministry of Education were restricted in favour of the school authorities subordinate to it.

After the re-establishment of the Republic of Austria in 1945, negotiations between the leading political groups were resumed in compliance with the provisions of Article 14 of the Federal Constitutional Act, which called for a special constitutional enactment to effect the final distribution of authority with respect to schools, education and adult education. In 1948 and 1955 only partial solutions were reached, concerning the regulations governing teachers' contracts and the establishment, maintenance and closing of schools. It was only in the Federal Constitutional Act of July 18, 1962, Federal Legal Gazette No. 215, that this gap was finally closed".

Under the new legislation the federal structure of school administration, which existed before 1934, was re-introduced, thus once more recognising the important regional differences in Austria.

With particular reference to the public compulsory schools, this means that the Federal Government determines the external organisation of the school system (e.g. structure and types of schools, delimitation of school districts, number of pupils per class, the establishment, maintenance and closing of schools). The Provinces are authorised to implement these basic legal dispositions through the adoption of appropriate legislative enactments.

At the same time, democratic principles have been re-introduced into school administration with the establishment of district and Provincial school councils on which parents and teachers have advisory votes.

2. The general task of the schools

The organisation of Austrian schools is based on the School Organisation Act (abbr.SOA) of July 25, 1962, which was published in Federal Legal Gazette No. 242. This Federal Act applies to the general and vocational compulsory schools, secondary schools providing access to higher education as well as those not providing such access,(1) and institutions for the training of teachers and educational assistants. It does not apply to schools of agriculture and forestry, the universities and the art academies.

The 1962 Act endows the entire Austrian school system with a common objective (Task of the Austrian School, SOA sect.2):

> "It shall be the task of the Austrian school to contribute to the development of the talents and potential abilities of the young in accordance with ethical, religious and social values and the appreciation of that which is true, good, and beautiful, by giving them an education corresponding to their respective stages of development and to their respective courses of study."

The word "contribute" underlines the basic idea that it is the parents who are responsible for the ethical, religious and social education of their children and that the school is only to assist them in that task. This is stated in an annotation to the text of the Act in the "Handbook of Regulations for the Compulsory General and Grammar Schools"(1) which declares that the school

> "... shall give young people the knowledge and the skills required for their future lives and occupations and train them to acquire knowledge on their own initiative. Young

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(1) Secondary schools which do not provide access to higher education are known as intermediate schools. See Sections A3 and 4 below.

people shall be trained to become healthy, capable, conscientious and responsible members of society and citizens of the democratic and federal Republic of Austria. They shall be encouraged to develop independent judgment and social awareness and to be receptive to the philosophy and political thinking of others. They shall also be made capable of participating in the economic and cultural life of Austria, of Europe and of the world, and of making their contribution, in love of freedom and peace, to the common tasks of mankind."

The Austrian school system shall be uniform in structure (SOA sect. 3). This uniform structure is reflected especially in the universal accessibility of all schools, in the common task of the schools, and in the legally established possibilities of transfer - e.g. from the upper primary school to the general secondary schools leading to higher education.(1)

3. The division of schools according to type and level

The structural division of the Austrian school system is determined by the various levels of age and maturity, the different talents of the pupils, the different tasks they will be called upon to fulfil in life (e.g. the tasks of men or women), and their different occupational aims. All pupils possessing the necessary qualifications have the opportunity of acquiring a higher education and of transferring from one type of school to another.

The schools are divided according to

(a) Type of education provided

- General schools;
- Vocational schools;
- Institutions for the training of teachers and educational assistants. (While such institutions should logically be classified as vocational schools, they are placed in a separate category for historical reasons and because of their independent status).

(b) Level of education (as determined by admission requirements and aims)

- Compulsory schools;
- Second-level schools: intermediate schools, which do not provide access to higher education; and secondary schools, which do provide such access;
- Academies and related institutions (admission to which is subject to the passing of the secondary school-leaving examination (Reifeprüfung) or an equivalent examination). In some cases, the term "academy" is used in a different sense for traditional reasons: e.g. the Theresianische Akademie is a general secondary school with a special curriculum, and "business academies" are secondary vocational schools providing access to higher education.

A brief description of each of the main types of schools, based essentially on the School Organisation Act of 1962, is given below. In order to facilitate comparison with the school systems of other countries, we have placed the appropriate Hilker/Nowotny symbol next to the name of each school type.(1)

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(1) See Sections A4, B1 and C1.

4. Survey of the main school types

The following school types are described in this section:(2)

(a) General compulsory schools
  (i) Primary schools - I 4;
  (ii) Upper primary schools - g II 4;
  (iii) Special schools - I 8;
  (iv) Polytechnic course - g II 5.

(b) Compulsory vocational schools - v III 3-4 p.t.

(c) Intermediate schools - v III 1-4
  (i) Intermediate vocational schools - v III 1-4;
  (ii) Intermediate schools for the training of teachers and educational assistants - t III 4, t III 2-5, T IV 1.

(d) Secondary schools
  (i) General secondary schools - G (II 4 + III 5);
  (ii) Secondary vocational schools - V III 5.

(e) Third-level schools (excluding universities)
  (i) Schools for higher social occupations - V IV 2, v IV 3;
  (ii) Teacher training colleges - T IV 2;
  (iii) Schools for vocational school teachers - T IV 2, t IV 2;
  (iv) Institutes of education.

(a) General compulsory schools

(Under the School Organisation Act of 1962, compulsory education has been extended from eight to nine years. This provision came into effect in 1966/67. For a large proportion of children the ninth year will be spent in the new one-year polytechnic (pre-vocational) course which was established specifically in connection with the extension of compulsory schooling; 34 per cent of all Austrian children of the relevant age group enrolled in the first polytechnic courses, which got underway in the autumn of 1966. At the same time, the nine-year requirement will also have the effect of ensuring that a larger proportion of the population will complete the eighth grade(3) and thus be eligible to continue their education at the secondary level).

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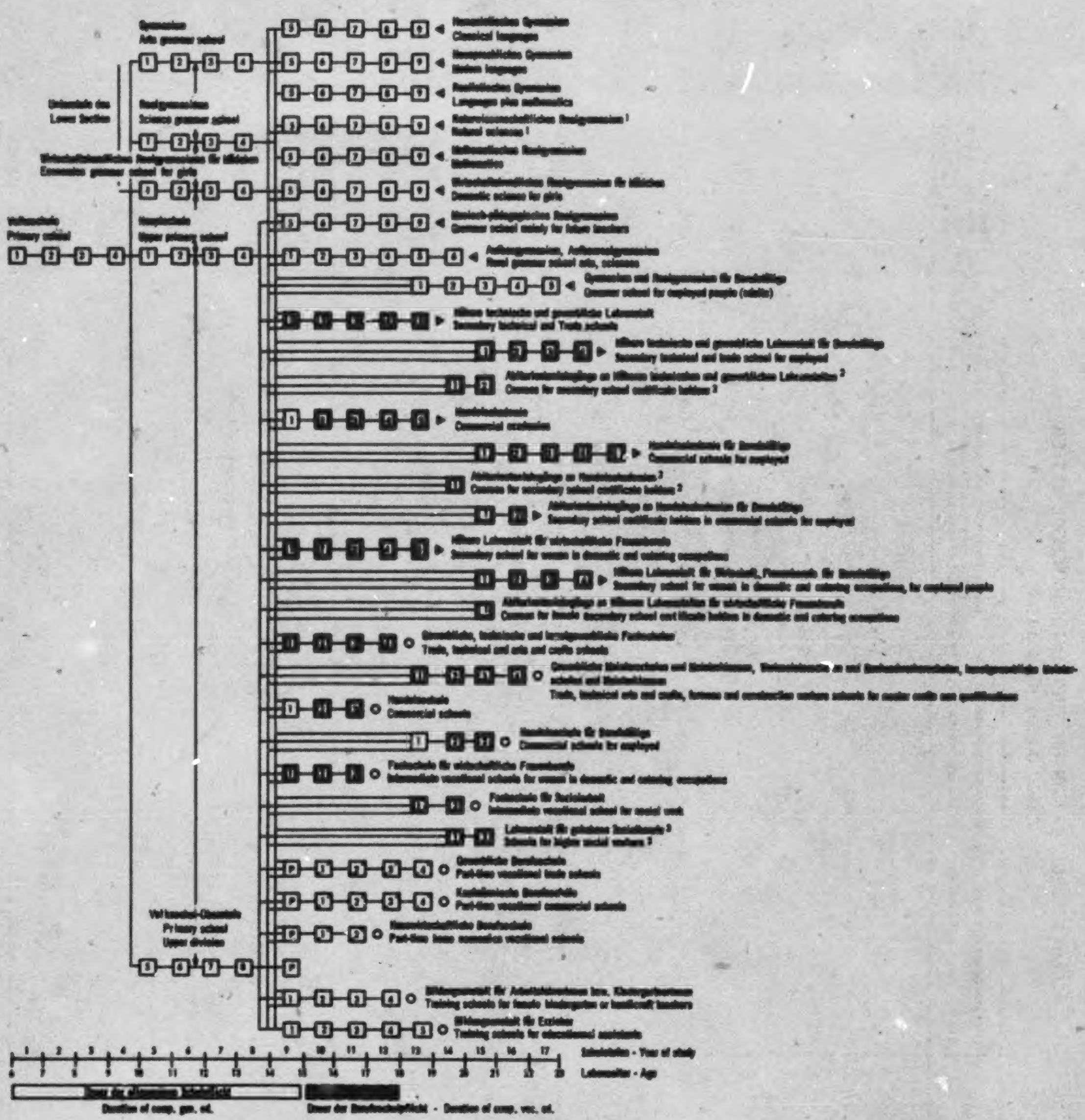
(1) See "Education in Europe - School Systems", Council of Europe, Strasbourg, 1965.
(2) Identification numbers refer to Chart 1.
(3) See projection of estimated future percentages of 14, 25 and 26 year-olds who will complete the eighth grade (see Annex to Chapter II, Table 5).

Chart 1. ORGANISATION OF THE AUSTRIAN SCHOOL SYSTEM

(School Organisation Act 1962)

School levels School types	COMPULSORY SCHOOLS	INTERMEDIATE SCHOOLS – i.e., SECONDARY SCHOOLS WHICH DO NOT PROVIDE ACCESS TO HIGHER EDUCATION	SECONDARY SCHOOLS PROVIDING ACCESS TO HIGHER EDUCATION (THROUGH ACQUISITION OF THE SCHOOL-LEAVING CERTIFICATE, "REIFEPRÜFUNG")	ACADEMIES AND RELATED INSTITUTIONS (IN PRINCIPLE, ADMISSION IS ONLY POSSIBLE WITH THE SCHOOL-LEAVING CERTIFICATE OR AN EQUIVALENT EXAMINATION)
General schools (g, G)	Primary school I 4 + g II 4 or g(G) II 4 Upper primary school g(G) II 4 Special school I 8 Polytechnic course g II 5	Do not exist in Austria g II 4 + g III 2	Arts grammar school G (II 4 + III 5) Science grammar school G (II 4 + III 5) Domestic science college for girls G (II 4 + III 5) Grammar school mainly for future teachers G III 5 Rural grammar school (arts) G III 1 + 5 Rural grammar school (science) G III 1 + 5 Arts grammar school for employed persons G III 5 Science grammar school for employed persons G III 5 Secondary boarding-school G II 4 + G III 5 Craft boarding school G II 4 + vG III 5(+1)	
Vocational schools (v, V)	Technical and trade vocational school v III 3-4 p.t. Commercial vocational school v III 3 p.t. Vocational school for domestic occupations v III 2 p.t.	Technical, trade and arts-and-crafts vocational schools v III 2 – 4 Commercial schools v III 3 Vocational schools for women's domestic occupations v III 1 – 3 Vocational schools for social workers v III 1 – 2	Secondary technical and trade schools V III (2 + 3) Business academies V III 5 Secondary schools for women's domestic occupations V III 5	Schools for the higher social occupations; admission with school-leaving certificate V IV 2 without school-leaving certificate v IV 3
Institutions for the training of teachers (t, T)		Schools for the training of women handicraft teachers t III 4 Schools for the training of kindergarten teachers t III 4 Schools for the training of educational assistants whose qualifying examination is not equivalent to the school-leaving certificate (Reifeprüfung) t III 2 – 5 (admission without school-leaving certificate) T IV 1 (admission with school-leaving certificate)	No longer exist in Austria	Teacher Training College T IV 2 Schools for vocational-school teachers T IV 2 (admission requirement : school-leaving certificate) or t IV 2 (admission requirement : master tradesman's examination) Institutes of education Institutes of vocational education (see School Organisation Oct. 1962, Division VI, Section 126, paragraph 4, page 91).

Chart 2. AUSTRIAN SCHOOL ORGANISATION ACT 1962


Gymnasium
Arts grammar school
Unterstufe der
Lower Section
Realgymnasium
Science grammar school
Volksschule
Primary school
Hauptschule
Upper primary school
Volksschul-Oberstufe
Primary school
Upper division
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17
Schulstufen - Year of study
6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
Lebensalter - Age
Duration of comp. gen. ed.
Dauer der Berufsschulpflicht - Duration of comp. voc. ed.

1. 2 Varianten:
   a) mit darstellender Geometrie
   b) ohne darstellende Geometrie

   Variants:
   a) with descriptive geometry
   b) without descriptive geometry

2. Abiturientenkurse führen nicht zur Reifeprüfung, sondern setzen diese voraus. Die Hochschulberechtigungen sind mit der vorangegangenen Reifeprüfung verbunden, neue werden nicht erworben.

   Courses for secondary school graduates do not lead to any secondary school certificate, but have it as a pre-condition. The right to enrol at university evolves from it.

3. Ist wie die Pädagogische Akademie und die Berufspädagogische Lehranstalt eine den Akademien verwandte Lehranstalt, zählt jedoch zu den berufsbildenden Schulen.

   Similar to teacher training colleges, but included with vocational schools.

◄ = allgemeine Hochschulreife
General school leaving certificate

► = Berechtigung zum Besuch einer wissenschaftlichen Hochschule gleicher oder verwandter Fachrichtung
Right to enter a science university faculty in same or related field of study

○ = Abschluss ohne Hochschulberechtigung
Leaving without general certificate of education

☐ = Vollzeitschule
Full-time schools

☐ = Teilzeitschule
Part-time schools

■ = mit Werkstättenunterricht verbunden
Connected with workshop training

P = Polytechnischer Lehrgang (Berufsvorschuljahr)
Year of Polytechnic course (pre-vocational school)

Die Sonderschule wurde hier nicht berücksichtigt
Special schools are not shown here

Die Pädagogische Akademie und die Berufspädagogische Lehranstalt sind in dieser Übersicht nicht dargestellt
Teacher training colleges and vocational teacher training colleges are not shown.

(i) Primary schools [I 4 + g II 4]

The eight-year primary school, beginning at the age of six, is divided into two four-year cycles known, respectively, as: basic schooling and the senior division. The latter, in addition to continuing the instruction in the basic elementary subjects, extends the scope of compulsory education to include: history and social studies, geography and economics, natural history and, for girls, domestic science. There is also a special form of the senior division known as the primary extension school, which seeks, through curricula adapted to local conditions, to provide children of remote mountain areas with a broader education than was previously available in such regions.

Public primary schools overwhelmingly outnumber private establishments: in 1964/65, there were 4,281 public primary schools with a total of 547,272 pupils, compared with 94 private schools having 12,608 pupils in all.

Instruction is given by general class teachers plus additional teachers for certain special subjects, such as religious instruction and handicrafts for girls. The pupil/teacher ratio for all Austrian primary schools averaged 32.4/1 in 1964/65.(1)

The number of classes per school varies widely. Two general organisational patterns may be distinguished: (a) schools that accommodate pupils of all eight grades in anywhere from one to eight separate classes - which means that, except in the eight-class schools, pupils of two or more grades sit together in the same class; and (b) four-class schools which teach only the first four grades. The Table below shows the evolution over three decades in the distribution of Austrian primary schools with reference to the number of classes per school. It will be noticed that although the trend is clearly towards a larger number of classes, more than half of all schools in 1964/65, accounting for 25.4 per cent of all primary school pupils, still had fewer than four classes.

After the fourth grade of the primary school, pupils may - upon passage of a voluntarily taken entrance examination - enter the first class of a general secondary school. Some 14 per cent of all fourth-grade leavers make this transfer.(2) Those who do not do so are now legally required to take the last four primary grades in an upper primary school(3) - described below - provided they are considered capable of pursuing the more difficult study programme this involves and provided such a school exists in their area. Upper primary pupils, as we shall see presently, have greater opportunities than those who remain in the ordinary primary school to join the general secondary school stream as late starters.

A large proportion of primary school graduates will, it was noted above, spend their ninth compulsory year in a polytechnic course. Further continued schooling - in the form of part-time vocational courses - is obligatory for all those who enter apprenticeship or are articled under equivalent arrangements. Moreover, primary school leavers are eligible for admission to intermediate vocational schools, where they can acquire skills in a wide variety of trades.

A possibility is also open to primary school graduates of obtaining access to higher education. This is through attendance at a secondary school without a lower division - i.e., one which begins its courses only after completion of the eighth grade of compulsory education. All secondary vocational schools belong to this category, as do several special forms of general secondary school specially set up to accommodate late starters.(1) But in fact very few graduates of the ordinary primary schools make this transition to secondary school; the overwhelming majority of children who do so come from the upper primary schools. For example, of all new entrants to the numerically most significant special form of general secondary school - the grammar schools mainly for future teachers - only about 3 per cent come directly from the eighth grade of an ordinary primary school.

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(1) The nation-wide maximum number of pupils per class in compulsory as well as intermediate and secondary schools was set at 36 by the 1962 school legislation. In view of the teacher shortage, however, this figure was raised in 1965 to 40, the revised maximum to remain in effect until 31st August 1968.

(2) See under "General secondary schools" below for more detailed data on the transition between the fourth primary grade and the general secondary schools.

(3) g (G) II 4

Table 1

Distribution of primary schools with reference to number of classes per school

(The figures in brackets show the number of private schools included in the overall totals)

No. of schools 1935/36	The 8 primary grades accommodated in:	Number of schools		
		1955/56	1960/61	1964/65
1,185	one class	1,006(4)	943(5)	892(3)
1,202	two classes	1,003(5)	1,037(7)	903(5)
716	three classes	623(8)	632(12)	619(11)
399	four classes	355(6)	295(3)	344(3)
318	five classes	263(5)	298(3)	608(8)
302	six classes	208(3)	245(2)	370(4)
34	seven classes	44(-)	51(-)	53(-)
4	eight classes	3(-)	3(-)	2(-)
422	four-class schools teaching only the first four grades	922(70)	889(63)	584(60)

(ii) Upper primary schools [g (G) II 4]

The four-year upper primary course is parallel to that of the senior division of the ordinary primary school but provides more academically oriented education. Teachers are required to be qualified in the subjects they teach, and the greater specialisation of the teaching force as compared with that of the ordinary primary schools is reflected in a considerably lower pupil/teacher ratio - a national average of 22/1 (1963/64) for the upper primary as against 32.4/1 (1964/65) for the ordinary primary school. (The average number of pupils per class in the upper primary schools is, however, roughly about the same as in the ordinary schools - 31.6 in 1964/65). Upper primary instruction must be organised in two streams wherever conditions permit. Both streams offer one modern foreign language, as contrasted with the ordinary primary school where there is no foreign language instruction.

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(1) See below under "General secondary schools".

In addition, Latin may be chosen as an optional subject in the first stream, and a second modern language in the second, but language instruction is compulsory only in the first stream.

The 1962 School Act imposes, as indicated in the preceding section, a legal obligation upon all capable pupils to take their last four primary grades in an upper primary school if such an establishment exists in their area. This will tend to place more children in a position to join the educational stream leading to university studies, since competent upper primary pupils, unlike those in the ordinary primary schools, have the possibility of transferring without examination to the next grade of a general secondary school provided they meet certain language requirements. (In two-stream upper primary schools, the right is restricted to first-stream pupils). The actual efficacy of this transfer link will be discussed in Section B of this chapter.

The graduates of upper primary schools have, of course, all the same possibilities of further schooling as regular primary school leavers and, in fact, benefit from them to a much larger degree, especially with regard to secondary education providing access to the universities. Upper primary leavers, for example, constitute some 82 per cent of all entrants to the grammar school mainly for future teachers, as compared with the 3 per cent who, it was noted above, come from the ordinary primary schools.

The total enrolment in upper primary schools was slightly less than 192,000 in 1964/65. This compared with 105,927 in the senior division of the ordinary primary school, thus representing 53.6 per cent of all Austrian children in the 5th to 8th grades inclusive.

The above upper primary enrolment figure was composed of 182,497 pupils in 793 public schools, and 9,367 in 70 private schools.

(iii) Special schools [I/8]

Only very brief mention will be made here of these schools, which are designed to enable physically and mentally handicapped children to receive, as far as possible, the equivalent of a regular eight-year primary education and to prepare them for an active life. In 1964/65, children at these schools represented 2.65 per cent of all compulsory school pupils. The trend has been towards expansion in the number of such schools and increased differentiation in the tasks to which they are assigned. Of the 148 special schools in 1964/65, all but seven were public.

(iv) Polytechnic course [g II 5]

Just over one-third (34 per cent) of all Austrian children of the relevant age group are, as noted above, currently (1966/67) taking the ninth and last year of their compulsory schooling in a polytechnic course. This newly established one-year course is intended for pupils who have finished the eighth primary grade but have not entered an intermediate or secondary school. The programme is designed to prepare the children for practical life (including leisure activities), to provide vocational guidance to those who have not yet chosen an occupation, and to round out the pupil's basic general education. In pursuance of this last-named objective, there are required courses in German, mathematics, social studies and economics, the fundamentals of natural science as they are relevant to the modern economy, engineering drawing, hygiene and, for girls, domestic science and child care.

(b) Compulsory vocational schools [v III 3-4 p.t.]

Courses in these schools are given either on a part-time basis (one full day a week throughout the year) or in certain seasons only or in block-release form (eight consecutive weeks a year). They cover occupations in industry, commerce, transportation and tourism as well as the women's domestic and catering field. All apprentices, and persons articled under an equivalent service contract, are legally required to attend a vocational school covering their specific occupations. Instruction in the schools is divided into as many grades as the apprenticeship period lasts in years. Compulsory attendance terminates upon completion of the apprenticeship or equivalent service.

In 1965/66 the estimated total enrolment in the compulsory vocational schools was about 138,000. While the age span of the students was wide, at least one-third of all Austrians in each of three age groups - the 14-, 15- and 16-year olds - were attending a compulsory vocational school in that year. But as a result of the extension of general compulsory education to nine years, the enrolment in the first grades of compulsory vocational schools will sharply decline in 1967, that of the second grades in 1968 and that of the third grades in 1969. It remains to be seen how the economy will make up for the loss of apprentices thus incurred.(1)

(c) Intermediate schools (second-level schools not providing access to higher education)

(i) Intermediate vocational schools [v III 1-4]

These are full-time schools whose curricula, ranging from one to four years in length, provide both the specific occupational training and the general educational background needed to produce skilled workers for direct entry to the labour market. Admission requirements are, in most cases, the satisfactory completion of the first eight years of compulsory schooling and passage of an entrance examination.

The main types of intermediate vocational school are:

- The trade, technical and arts-and-crafts schools (v III 2-4), which offer two- to four-year training in a wide variety of occupations in the manufacturing and processing industries, in the arts and crafts, in the commercial branches of some specific industries (e.g. textiles), in some service industries, such as the hotel and catering trades;
- The business schools (v III 3), which give three-year courses in all branches of commercial activity;
- The one-to three-year vocational schools for women's domestic and catering occupations (v III 1-3);
- The one-and two-year courses in the vocational schools for social workers (v III 1 and v III 2).

There are also special classes and special forms of these schools, designed inter alia to give part-time training to employed persons and to upgrade workers by preparing them to qualify as foremen, etc.

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(1) See Chapter III, Section E, regarding the problem of insufficient stocks of new skilled workers.

There was an estimated total enrolment of about 25,000 in the intermediate vocational schools taken as a whole in 1965/66. The participation ratio for each of the age groups most heavily represented in these schools - the 14- to 16-year-olds inclusive - ranged from under 6 per cent to less than 7 per cent. Both the needs of the economy for skilled manpower and recent social demand trends call for a considerable expansion in the capacity of these schools.(1)

(ii) Intermediate schools for the training of teachers and educational assistants [t III 4, t III 2-5, T IV 1]

These schools - whose total combined enrolment numbers only about 2,000 - have been set up on a new basis under the 1962 School Organisation Act as part of a reorganisation of teacher training in general.(2) Two of the schools in this category - the schools for the training of women handicraft teachers (t III 4) and those for the training of kindergarten teachers (t III 4) - constitute reformed versions of similar schools that existed before the 1962 legislation. They provide a four-year training course as compared with the three-year programmes of the older-type schools. Admission is subject to the successful completion of the first eight years of compulsory schooling and the passage of an aptitude test.

A third intermediate-level teacher training school - the school for educational assistants (t III 2-5, T IV 1) - is entirely new. Minimum admission requirements are the same as for the two school types described above. But the length of the course ranges from one to five years depending on the educational background of the students.

About 60 per cent of the roughly 2,000 students in the intermediate schools for the training of teachers and educational assistants are enrolled in private establishments, which outnumber the public schools in this category.

(d) Secondary schools

The secondary school leaving examination - "Reifeprüfung" - is the basic requirement for admission to the university. The various secondary schools will therefore be discussed at some length in Section B of this chapter, whose purpose it is to examine the ways in which access to higher education has been broadened over the past 40 years. In the present section, attention will be concentrated on giving a general idea of the structure and functions of the secondary schools, as well as of the magnitude of their enrolments, so that the developments traced in Section B may be more readily understood).

(i) General secondary schools [G (II 4 + III 5)]

The general secondary schools are composed of a four-year lower division - which pupils enter after the fourth primary school grade upon passage of a voluntarily taken entrance examination - and a five-year upper division, making a total of nine years. Prior to the adoption of the 1962 School Organisation Act, the length of studies was only eight years. The first graduates of the new nine-year schools will receive their diplomas in 1972.

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(1) See Chapter II for future enrolment projections, Chapter III, Section B, with respect to the growing importance of these schools for the economy, and Chapter VI, Table 89, for an indication of pent-up demand for places in both the intermediate and secondary vocational schools.

(2) See below under "Teacher training colleges".

The descriptive list below shows the main types of general secondary school and stresses in particular their differences with respect to language instruction - which, as we shall see subsequently,(1) is of great importance for the relative ease with which late starters may transfer to the different school types.

Types of general secondary school:

Arts grammar school (Gymnasium) [G (II 4 + III 5)] (first modern language 1st to 9th, Latin 3rd to 9th grades), with the following types of upper division:

- Humanistisches Gymnasium (Greek 5th to 9th grades);
- Neusprachliches Gymnasium (Latin and modern languages, second modern language (5th to 9th grades);
- Realistisches Gymnasium (descriptive geometry 5th to 9th grades).

Science grammar school (Realgymnasium) [G (II 4 + III 5)] (first modern language 1st to 9th grades, geometrical drawing in the lower division), with the following types of upper division:

- Naturwissenschaftliches Realgymnasium (Latin 5th to 9th, plane and solid geometry or supplementary natural science courses 5th to 9th grades);
- Mathematisches Realgymnasium (second foreign language 5th to 9th, plane and solid geometry 5th to 9th grades).

Domestic science college for girls (Wirtschaftskundliches Realgymnasium für Mädchen) [G (II + III 5)] (first modern language 1st to 9th, second modern language or Latin 5th to 9th grades, subjects preparing girls for their future lives as wives and mothers).

A total of 14,789 fourth-grade leavers took the general secondary school entrance examination in 1964/65. Of these, 825 (5.58 per cent) failed. The Table below shows the inflow to the general secondary schools in recent years expressed as a percentage of all children completing the fourth primary grade.

Apart from the usual procedure under which pupils are admitted after the fourth primary grade, capable children in upper primary schools (fifth to eighth grades) may, as already noted, transfer without examination to the next grade of a general secondary school in which the same foreign language they are already studying is taught. But, as we shall see, the percentage of upper primary pupils who took advantage of such transfers has been rather low in the past.(1)

The first two years of the lower division, in which there is no curricula differentiation between types of general secondary schools, serve a function similar to that of the "observation cycles" which exist in other countries. The lower division as a whole provides a broad general education for pupils who go no farther in the general secondary school and transfer to vocational training. Of the approximately 6,740 pupils enrolling in the first year of the secondary business schools and the secondary and intermediate technical and trade schools in 1964/65, some 1,480 came from the general secondary schools.

The proportion of pupils who do not move on to the next grade of general secondary

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(1) See Section B 1.

Table 2

Inflow to general secondary schools as percentage of fourth-grade leavers

(in percent)

	Austria as a whole (including Vienna)	Vienna alone[a]
1960	13.16	25.8
1961	12.74	28.6
1962	12.82	29.3
1963	13.20	30.9
1964	13.87	32.2

(a) The figures for the individual municipal districts in Vienna show very wide differences. The average percentage figures for the years 1960-1964 ranged from 15 per cent to 50 per cent for the 23 districts.

school and transfer to vocational training. Of the approximately 6,740 pupils enrolling in the first-year of the secondary business schools and the secondary and intermediate technical and trade schools in 1964/65, some 1,480 came from the general secondary schools.

The proportion of pupils who do not move on to the next grade of general secondary school because of failure to attain the required academic average is rather small in the first two years but subsequently rises considerably. The average percentages are as follows: 5 per cent in the first year, 6 per cent in the second, and 10 - 12 per cent from the third year on.

In addition to the main types of general secondary school there are three special forms which have no lower division; i.e.,they recruit their first-year pupils from those who have completed the eighth grade of compulsory schooling. These secondary schools for late-starters are: the rural arts and science grammar schools (G III 1 + 5 - formerly five, now six years); the arts and science grammar schools for employed persons (G III 5 - formerly four years, now five); and the grammar schools mainly for future teachers (G III 5 - a five-year school newly established under the 1962 School Organisation Act).

The first two of the above-mentioned special types had rather rapidly increasing enrolments in recent years, but are not numerically very significant. The third type - the grammar school mainly for future teachers (Musisch-pädagogisches Realgymnasium) - shows, however, considerable promise as a means of bringing sizeable numbers of rural children into the educational stream leading to the university. The importance of this type of school is rapidly growing, so that its titles are rather misleading. Despite its original purpose, more and more leavers from upper primary schools (especially in rural areas) consider it as a way to higher education in general. The role and importance of these special schools are discussed in detail in Section B.

The total enrolment in the general secondary schools (excluding the grammar schools for future teachers) was about 85,500 in 1964/65; some 72,300 of these were enrolled in 153 public schools and about 13,200 in 58 private schools. The participation of the 10- to 17-year old group in the general secondary schools (again, excluding the grammar schools for future teachers) has risen from 6.52 per cent in 1950/51 to 11.14 per cent in 1965/66.

There was an average of 29 pupils to a class in general secondary schools in 1964/65.

(ii) Secondary vocational schools [V III 5]

These are five-year schools which provide a general and technical education enabling their graduates to enter roughly the same range of occupations as the intermediate vocational schools but at a higher level of competence. Moreover, the secondary vocational schools grant a school-leaving certificate which permits entrance to higher education, though usually only in the same field in which the graduate has specialised or in related fields.(1)

The main types of secondary vocational school are: the secondary technical and trade schools (V III 2 + 3); the business academies (V III 5); and the secondary schools for women's domestic and catering occupations (V III 5). There are also special forms of these schools for employed persons and secondary-school leavers.

The quantitative flows through the secondary vocational schools will be shown in Section B.4. It will suffice here to note that their share of the relevant age groups is much lower than that of the general secondary schools. In 1965/66, the participation of, for example, 16- and 17-year olds in the secondary vocational schools was only an estimated 2.76 per cent and 3.48 per cent respectively as compared with 9.73 per cent and 8.31 per cent for the general secondary schools according to the First Assessment. (In absolute figures - for the year 1965/66 - there were some 21,000 students enrolled in the five grades of secondary vocational schools, as compared with 44,500 in the upper section - grades 5 to 8 - of the general secondary schools).

In Chapter II, the Second Assessment of future school flows will reflect both the rising demand for places in the secondary vocational schools and the intentions of the authorities to increase their capacity. Still more ambitious expansion targets will be proposed in Chapter VI, in the light of both social demand and the urgent need of the economy for the specialised workers produced by these schools.

(e) Third-level schools (excluding universities)

These schools, grouped together as academies and related institutions, were all established by the 1962 School Organisation Act. They generally require a secondary school leaving examination for admission.

(i) Schools for higher social occupations [V IV 2 : admission with secondary school leaving certificate; v IV 3: admission without secondary school leaving certificate].

This is a two-year school (three years for those without a secondary school leaving certificate) designed to prepare students for more advanced activities in the field of social work. In 1964/65, the year of the first leaving examination given by these schools, the total enrolment was 154. There were seven schools for higher social occupations in that year, all private.

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(1) See Section B.4.

(ii) Teacher training colleges [T IV 2]

The establishment of these colleges under the 1962 Act is part of a general reorganisation of teacher training. The old type of five-year secondary school for teacher training commenced immediately after compulsory school and combined the functions of general secondary education and professional training. The former function has now been taken over by the grammar school mainly for future teachers, which provides a five-year general secondary course, while the professional training is henceforth to be the task of the new two-year teacher training colleges. Candidates for admission to these colleges must have the leaving certificate of the grammar school for future teachers or of another secondary school and must also pass an aptitude test.

The new teacher training colleges have begun to operate on an experimental basis in 1966/67 and, under the School Organisation Act, must be regularly established by September 1968. During the present transitional period the secondary schools for teacher training are still functioning and their enrolment figures are, in the official statistics, incorporated with those of the grammar schools for future teachers. An idea of the order of magnitude of teacher training before the present reform went into effect may be had from the fact that in 1962/63 the secondary schools for teacher training had a total enrolment of some 7,000. In 1964/65 there was a combined enrolment of 9,000 in these schools and the grammar schools for future teachers.

(iii) Schools for vocational school teachers [T IV 2](for entrants with the secondary school leaving certificate); t IV 2 (for entrants with the master craftsman's examination).

These schools have been established to train teachers of domestic science as well as of specific vocational subjects. The programme varies in length between two and four semesters. In 1964/65 - the year in which these schools graduated their first students - the total enrolment was 113. The schools for vocational school teachers replace the former schools for teachers of domestic science and vocational subjects.

(iv) Institutes of education

These institutes are designed primarily for the further training of general compulsory and general secondary school teachers. For example, they prepare primary school teachers to take the examination for the upper primary and the special school teaching diplomas. They also carry out educational research.

B. Development of the System with a View to Widening Access to Higher Education

The requirements of the Austrian economy for highly qualified personnel are certain to be even greater in the future than they are today. This demand will contribute to a continuing rise in the number of graduates of secondary schools providing access to higher education. The increase in the flow of secondary school graduates in Austria - both in the recent past and projected ahead to the end of the present decade - may be shown in terms of the increasing proportion of these graduates to the relevant age groups:

1950	1955	1959	1963	1970
7%	6.5%	10%	11.1%	14%

In view of the importance of the rising need for highly qualified personnel mentioned above, a necessary foundation for the investigations to be carried out in this report will be a survey of structural reforms effected up to the present time with a view to making higher education accessible to more and more people. For this purpose, the changes in the relationship between the secondary schools leading to higher education and the compulsory-level schools supplying them with pupils - more precisely, the changes and improvements in the channels of access from the one type of school to the other - will be traced here. We shall first of all be concerned with the relationship between the compulsory schools and the general secondary schools (the former general grammar schools - allgemeinbildende Mittelschulen).

1. Establishment of transfer links to the general grammar schools (allgemeinbildende Mittelschulen) [G II III 8]

In the first quarter of this century there was only one possibility of transfer from the primary to the grammar school, which in turn was the only path to the university: the passing, after four or five years of primary school, of an entrance examination for admission to the arts grammar school, the science grammar school or the science grammar school without Latin (the school leaving certificate of the last-named type was not then sufficient for entrance to all kinds of university study). A pupil who had not succeeded at the age of ten or eleven in gaining admission to a grammar school was permanently excluded from university study. The stream leading to the university was fed only by its "source", i.e. by the primary schools; there were no "tributaries" joining it later on. Thus, there were two strictly separate categories of school for the 10- (or 11-) to 14-year olds until other transfer possibilities were provided for in the School Acts of 1927 (Upper Primary School Act and Grammar School Act of August 2, 1927). These Acts abolished the old three-year "Bürgerschule" (former upper primary school) g II 3 and the fifth grade of primary school, and created a new four-year upper primary school g (G) II 4. This new school type, which children could enter without examination upon satisfactory completion of the fourth grade of the general primary school, was normally to be conducted in two streams. The streams were differentiated as to the scope of the education provided and the methods of instruction. Capable upper primary pupils were granted the possibility, upon completion of a given grade, of transferring to a grammar school under the conditions described below:

- First-stream upper primary pupils whose annual grades were "good" and who successfully pursued work in a foreign language could transfer, without taking an entrance examination, to the next class of a grammar school in which the same language was taught. Until 1938, foreign language courses were optional in the upper primary schools.
- The same transfer possibilities were accorded to pupils of one-stream upper primary schools who were considered by the teaching staff to be particularly capable.
- Upper primary leavers could, after the eighth (final) grade and under the conditions described above, transfer to the reform-type science grammar school ("Reformrealgymnasium"). In this type of grammar school, Latin was not taught before the fifth class, i.e.,the class which such transfer pupils would be entering.(1)

At the same time, the 1927 legislation provided that the grammar schools were to be eight-grade establishments divided into four-year lower and four-year upper divisions and were to be uniform in organisation throughout Austria. As in the past, admission to the first year of the grammar school was subject to the passing of an entrance examination - registration for which had to be undertaken voluntarily(2) - after completion of the fourth grade of primary school.

To revert to the metaphor used above, we may say that the transfer possibilities provided for in the 1927 School Acts represent the first "tributary" in the stream leading to the university.(3)

After the restless years between 1934 and 1938 and the World War II period (between

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(1) "Nevertheless this new transfer possibility did not cause an overcrowding of the grammar schools since the number of pupils availing themselves of the opportunity provided by by the Act was small". Dr. L. Battista in "100 Jahre Unterrichtsministerium, 1848-1948" (100 Years of the Federal Ministry of Education, 1848-1948), Österreichischer Bundesverlag, 1948, page 162. This anniversary publication was prepared by a committee composed of members of the Federal Ministry of Education under the chairmanship of Dr.E.Loebenstein.

(2) The provision "subject to voluntary registration", left it up to the parents to register their children for the entrance examination. Therefore, the Austrian entrance examination is different from, e.g. the British 11+ examination in that in Great Britain all the eleven-year olds have to take this examination whereas in Austria admission to a general secondary school is effected by voluntary registration for the examination.

(3) The upper primary school is

"... at the core of the 1927 reform because it has introduced into the organisation of the entire school system uniformity, on the one hand, and flexibility, on the other. It follows directly after the fourth primary school grade and enables pupils who have completed upper primary school to go on directly to vocational schools. Moreover, it permits capable pupils to transfer to grammar school without loss of time and without their having to pass any examinations. Yet the school types between which the upper primary school forms a sort of link are not affected in their substance by this.

"Unfortunately, a setback occurred only seven years after this reform. The great numbers of pupils who sought admission to grammar school and of graduates of grammar schools and universities who failed to find adequate employment caused the Minister of Education, Dr. Kurt Schuschnigg, to make the grammar school curriculum so difficult that the number of graduates necessarily decreased. The relevant Federal Act of March 23, 1934, and the curriculum regulations issued subsequent to that Act, rendered it practically impossible for pupils to transfer from upper primary to grammar school, thus widening once more the gap between grammar school and primary school". (From the essay quoted above by Dr. L. Battista in "100 Years of the Federal Ministry of Education, 1848-1948", op.cit., pp.162 ff.)

This historical development is of particular importance to this report since between 1929 and 1934 Austria, in spite of a pronounced decrease of the gross national product, experienced a great inflow of students to the secondary schools and the institutions of higher education, a flow which was checked not so much by the depression as by the school acts. We regard this fact as a warning against the simplification of assuming that "higher national income equals increased inflow to the higher schools". Chapter III deals with this question in greater detail.

1938 and 1945 the German school laws were in force in Austria), the Austrian school system took the form which is illustrated in Diagram I below.

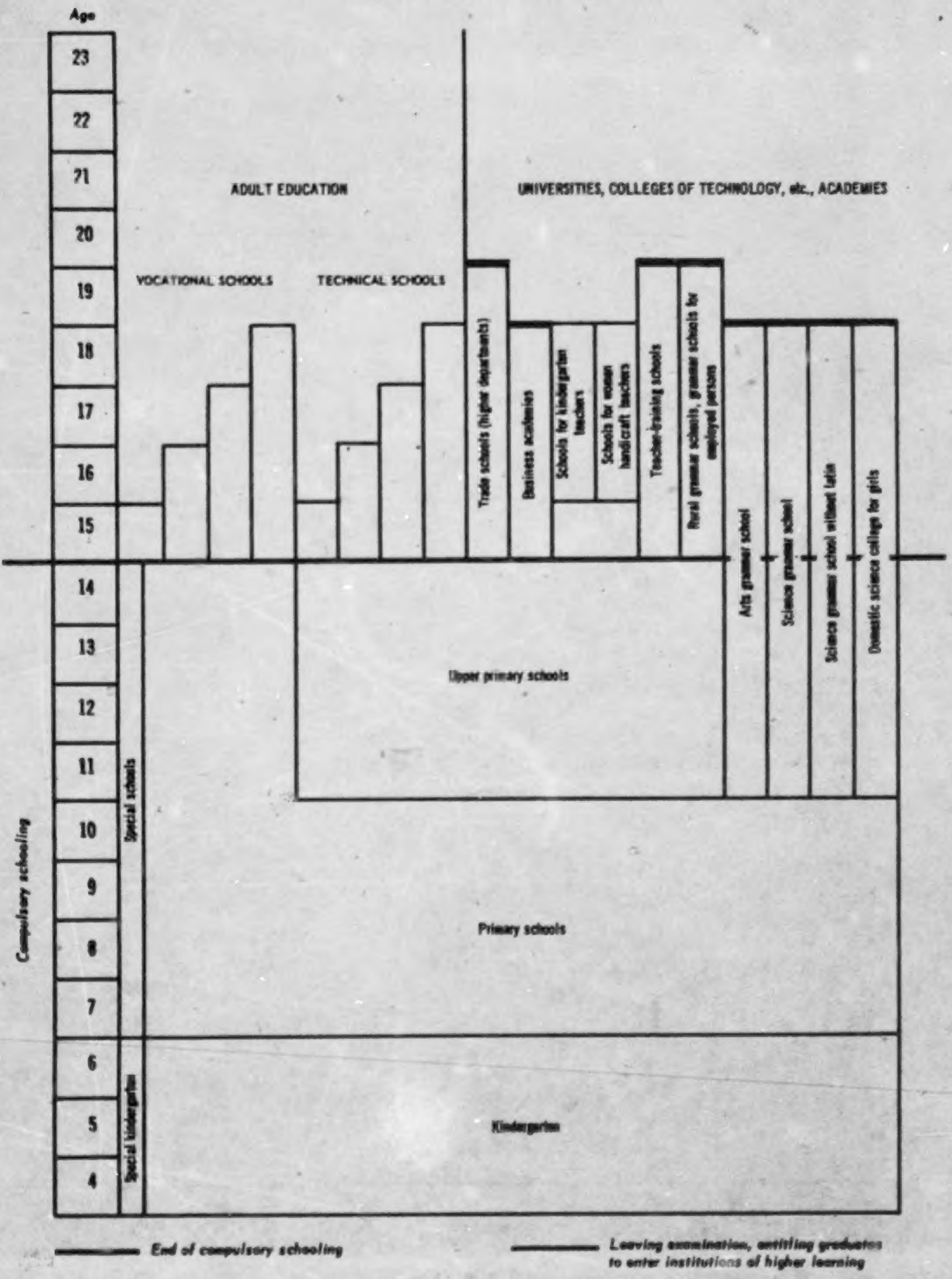
In the post-war period, pupils leaving the fourth grade of primary school had the same prospects of continued schooling as before the war: capable children could enter an upper primary school or, upon passage of an entrance examination, could enter the first year of grammar school (arts grammar school, science grammar school, science grammar school without Latin, or the domestic science college for girls). Pupils who did not effect either of these transfers remained on in the ordinary primary school to complete their compulsory schooling in the senior division.

After 1945 there were increased possibilities of transfer from upper primary school to grammar school in so far as a modern language was compulsory for pupils of the first stream. The pedagogic principle of "bridges and crosslinks", first established in 1927, regained it's importance and began to be applied more widely. Upper primary pupils with the required grades were permitted to transfer to grammar schools after the first and second years provided that in these grammar schools Latin was taught only from the third year onwards (i.e. to the arts and science grammar schools prevailing in the Eastern part of Austria; at the arts and science grammar schools prevailing in the Western parts of Austria, Latin was taught starting in the first year). Academic performance was considered acceptable for purposes of transfer if the pupil received, on his annual report card, a mark of "good" in at least half of the compulsory subjects, including German, mathematics, and a modern language, and "satisfactory" in the other compulsory subjects. (The Austrian marks are: "very good", "good", "satisfactory", "adequate" and "inadequate").

After the third and fourth years pupils with the required grades could transfer only to the science grammar school without Latin (Realschule) - or with Latin only from the fifth year on (Lateinrealschule) - and to the domestic science college for girls (Frauenoberschule). However, it was possible for any pupil from upper primary (or primary) school to take an entrance examination in all subjects permitting him to transfer to the next grade of a grammar school (or to transfer to the same grade, thus repeating it voluntarily).

Diagram I

STRUCTURE OF THE AUSTRIAN SCHOOL SYSTEM BEFORE THE ENTRY INTO FORCE OF THE SCHOOL ORGANISATION ACT OF 1962


Age
23
22
21
20
19
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
Compulsory schooling
ADULT EDUCATION
UNIVERSITIES, COLLEGES OF TECHNOLOGY, etc., ACADEMIES
VOCATIONAL SCHOOLS
TECHNICAL SCHOOLS
Trade schools (higher departments)
Business academies
Schools for kindergarten teachers
Schools for women handicraft teachers
Teacher-training schools
Rural grammar schools, grammar schools for employed persons
Arts grammar school
Science grammar school
Science grammar school without Latin
Domestic science college for girls
Upper primary schools
Special schools
Primary schools
Special kindergarten
Kindergarten
End of compulsory schooling
Leaving examination, entitling graduates to enter institutions of higher learning

A statistical survey covering the period between 1919/20 and 1964/65 clearly shows a marked increase of enrolment in grammar schools, as can be seen from the following table. A comparison of the indices representing the number of grammar school pupils with the indices for the total relevant age groups (10-17-year-olds) makes it clear that the proportion of young people attending grammar school is strongly on the increase.

Table 3

Grammar school enrolment compared with total 10 to 17 year-old population, 1919/20 - 1964/65 (1)
Index: 1919/20 = 100

	Size of 10-17 year-old age group	Grammar school enrolment
1919/20	100	100
1928/29	80	139
1937/38	88	174
1946/47	70	134
1955/56	85	220
1964/65	76	237
1965/66	76	239

(1) See "Österreichische Schulstatistik 1955/56" (Austrian School Statistics 1955/56).

Graph 1 traces the development of grammar school enrolment for males and females considered separately. After World War I a marked increase took place: by 1933/34, 11 of 100 male and 6 of 100 female adolescents were attending grammar schools.

However, this was followed by a decrease in total enrolment which seems generally to have continued until the final years of World War II (for these years no data are available).

In 1964/65, 14 out of 100 male and 8 out of 100 female adolescents respectively were attending grammar schools and general secondary schools.(1)

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(1) Since adoption of the 1962 School Organisation Act, grammar schools have been known as general secondary schools.

Graph 1

DEVELOPMENT OF GRAMMAR SCHOOL ENROLMENT SINCE 1919/20
EXPRESSED IN PERCENTAGES OF THE 10-17 YEAR-OLD AGE GROUP

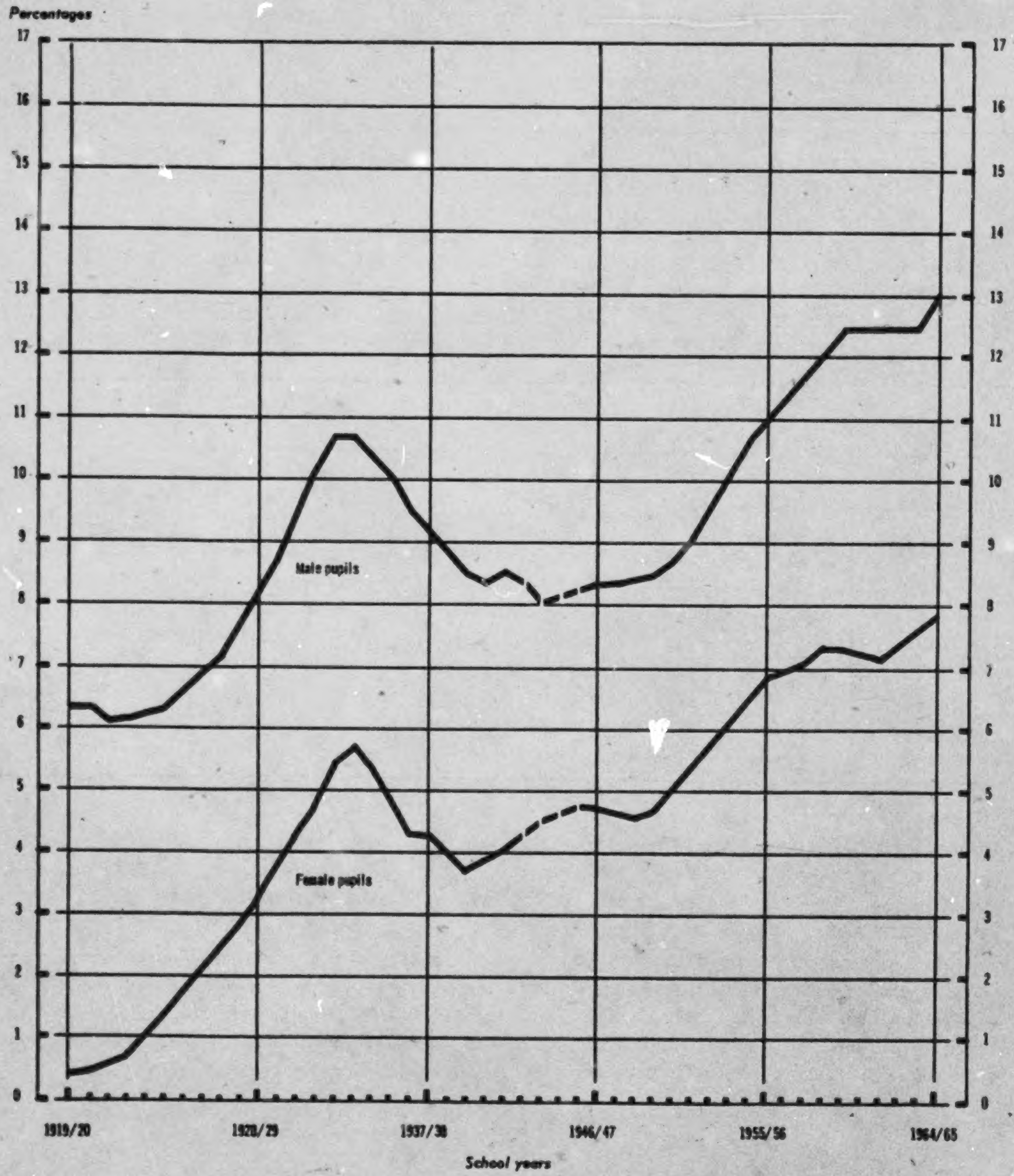

Table 4 shows the development of enrolment in the 1st year of grammar school over the past ten years. Three groups of pupils may be differentiated:

(a) Pupils who enter grammar school (general secondary school) upon passage of entrance examination after fourth grade of primary school;

(b) Pupils who have to repeat the first year;

(c) Pupils who enter the first year of grammar school after completion of the first year of upper primary school; i.e. who voluntarily repeat a year in transferring to grammar school.

Groups (b) and (c) may be seen to have decreased continuously over the past ten years.

Table 4

Inflow to the first year of grammar school (since 1963/64 general secondary school)

(In percent)

School year	Fourth grade primary school leavers having passed the entrance examination	Pupils having to repeat the first year	Pupils having transferred without an entrance exam after completion of first year of upper primary school	Total enrolment in the first year
1955/56 . . .	11,236 = 89.69	723 = 5.77	569 = 4.54	12,528 = 100
1956/57 . . .	9,902 = 90.15	638 = 5.80	445 = 4.05	10,985 = 100
1957/58 . . .	13,259 = 93.13	571 = 4.01	408 = 2.86	14,238 = 100
1958/59 . . .	13,095 = 92.47	649 = 4.58	418 = 2.95	14,162 = 100
1959/60 . . .	12,463 = 92.04	699 = 5.16	380 = 2.80	13,542 = 100
1960/61 . . .	11,434 = 91.91	643 = 5.17	363 = 2.92	12,440 = 100
1961/62 . . .	11,236 = 92.13	581 = 4.76	379 = 3.11	12,196 = 100
1962/63 . . .	11,785 = 92.97	542 = 4.28	349 = 2.75	12,676 = 100
1963/64 . . .	12,792 = 94.97	450 = 3.34	227 = 1.69	13,469 = 100
1964/65 . . .	13,809 = 95.94	459 = 3.19	125 = 0.87	14,393 = 100
1965/66 . . .	15,004 = 95.56	528 = 3.36	170 = 1.08	15,702 = 100

In examining the trend towards greater accessibility of the institutions of higher education, the number of so-called "genuine" transfers from upper primary schools to the next grade of grammar school (general secondary school), with or without entrance examination, is of special interest.

To the numbers of upper primary school pupils making the transfer to general secondary schools may be added the number who went into the 5th form of the "grammar school mainly for future teachers": 1412 in 1961/62, 1974 in 1963/64, 2044 in 1964/65 and 2152 in 1965/66 (no figure available for 1962/63). However, even with these added figures the "efficiency" of this transfer link is shown to have been in the very low range of one per cent or less.

Table 5

Transfers from upper primary school to the next grade of general secondary schools without special categories in the school years 1960/61 to 1964/65:

i.e. transfers

- from the 1st form of upper primary school to the 2nd form of the general secondary school;
- from the 2nd form of upper primary school to the 3rd form of the general secondary school;
- from the 3rd form of upper primary school to the 4th form of the general secondary school;
- from the 4th form of upper primary school to the 5th form of the general secondary school.

School year	Number of upper primary school pupils in the first stream and of the single-streamed upper primary schools (form 1 to 4 incl.)	School year	Thereof: number of upper primary school pupils who transfer to the next form of a general secondary school (without special categories)	
			Absolute figures	In percentage
1960/61	157,303	1961/62 . . .	350	0.22
1961/62	151,835	1962/63 . . .	431	0.28
1962/63	146,398	1963/64 . . .	521	0.36
1963/64	141,861	1964/65 . . .	746	0.53
1964/65	137,489	1965/66 . . .	638	0.46

2. Creation of a "Second Path" to higher education: the special forms of grammar school

The 1927 Grammar School Acts not only created possibilities of transfer from upper primary school to grammar school but also laid the first legal foundations for a "second path" leading to higher education. Two types of establishments were created: the rural grammar schools and the grammar schools for employed persons.

The relevant passages of the 1927 Grammar School Act read as follows:

"The Federal Minister of Education shall be authorised to establish tentatively several rural grammar schools (Aufbauschulen) within a period of six years after the entry into force of this Act; these shall serve the purpose of enabling gifted pupils who are not in a position to embark upon grammar school studies until after the completion of compulsory schooling to obtain a grammar school education through a special five-year course of study.

"The Federal Minister of Education may, within the period of time laid down in paragraph 1, tentatively organise, at individual grammar schools, courses of several years' duration (grammar schools for employed persons - Arbeitermittelschulen) in order to enable persons who, after completion of a primary or upper primary school (Bürgerschule - old type of upper primary school), have begun work, and have finished vocational training or have completed the 17th year of age, to gain access to institutions of higher learning by means of such courses".

As noted earlier (Section A4), the five-year rural grammar school has been extended, under the 1962 School Organisation Act, to six years, and the grammar school for employed persons, originally a four-year course, has been extended to five years.(1)

Thus, apart from the "main stream" leading to higher education (which, as we have seen, has been fed by a "tributary" since 1927) additional "streams" or "paths" leading to the same end have also existed since 1927. Their increased effectiveness since 1956 may be seen from the development of the number of graduates of these special school types shown alongside that of the regular eight- (now nine-) year grammar school in Table 6.

As shown in the following table, the total number of graduates from the various types of general grammar school (excluding the teacher-training schools) was on the increase between 1956 and 1962 and declined afterwards. However, if we examine the size of relevant age group - i.e. from approximately 17½ to 18½ years old - a similar though less pronounced increase and decrease may be observed, which shows that the percentage of graduates in respect of the corresponding age group has risen. Thus,

3.7 per cent of the relevant age group in the birth cohorts 1933 - 1936,
3.8 " " " " " " " " " " " 1937 - 1940,
6.1 " " " " " " " " " " " 1941 - 1944,
and approximately
6.5 " " " " " " " " " " " 1945 - 1947,

graduated from general grammar schools.

A growing popularity of the "second path" of education may thus be observed, although numerically it has not been of great importance. For graduates from rural grammar schools and grammar schools for employed persons the demographic development is not as significant as for the other grammar school pupils, since the students of these special school types belong to many different age groups.

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(1) Mention should also be made of the special "leaving examination for employed persons" (Berufsreifeprüfung), passage of which entitles persons who do not possess a school leaving certificate and who have taken up an occupation to study at an institution of higher education on the basis of their occupational knowledge or of intensive studies which they may have carried out in a given field. So far about 250 persons have availed themselves of this opportunity, which was introduced in 1945.

Table 6

Graduates of general grammar schools (1)

Year	In absolute figures				Percentage distribution among school types				Year	Progression over time expressed in indices (1956 = 100)				
	GSS	GRGS	GEP	Total	GSS	GRGS	GEP	Total		GSS	GRGS	GEP	Total	Size of relevant age-group
1956	3135	33	91	3259	96.20	1.01	2.79	100	1956	100	100	100	100	100
1957	3363	35	67	3465	97.06	1.01	1.93	100	1957	107.28	106.06	73.63	106.32	134.37
1958	6266	43	67	6376	98.28	0.67	1.05	100	1958	199.89	130.31	73.63	195.64	153.98
1959	7105	38	107	7250	98.00	0.52	1.48	100	1959	226.65	115.15	117.58	222.46	147.75
1960	7142	65	115	7322	97.54	0.89	1.57	100	1960	227.83	196.98	126.37	224.67	130.10
1961	7348	44	124	7516	97.76	0.59	1.65	100	1961	234.40	133.34	136.26	230.62	123.88
1962	7554	50	164	7768	97.25	0.64	2.11	100	1962	240.97	151.52	180.22	238.36	123.30
1963	6591	69	175	6835	96.43	1.01	2.56	100	1963	210.25	209.10	192.31	209.73	102.42
1964	5852	70	187	6109	95.79	1.15	3.06	100	1964	186.66	212.13	205.49	187.45	104.38
1965	6900	85	199	7194	95.91	1.32	2.77	100	1965	220.09	287.87	218.68	220.74	104.93

(1) Excluding teacher training schools and grammar schools for future teachers. See section B3 below.

GSS - Graduates of the regular 8-(now 9-) year general secondary schools; included are graduates of arts grammar schools, science grammar schools, science grammar schools without Latin and domestic science colleges for girls, plus special students.

GRGS- Graduates of rural grammar schools.

GEP - Graduates of grammar schools for employed persons.

The following table shows the development of enrolment at the regular grammar schools, the grammar schools for employed persons and the rural grammar schools, between 1956/57 and 1964/65.

Table 7

Enrolment in general grammar schools and special types

	General grammar schools (since 1963 general secondary schools)		Rural grammar schools		Grammar schools for employed persons		Total	
		%		%		%		%
1956/57	80,316	98.35	355	0.43	993	1.22	81,664	100
1957/58	82,579	98.11	384	0.46	1,203	1.43	84,166	100
1958/59	83,582	97.86	413	0.48	1,416	1.66	85,411	100
1959/60	82,899	97.44	474	0.56	1,704	2.00	85,077	100
1960/61	81,117	97.23	519	0.62	1,790	2.15	83,426	100
1961/62	79,137	97.06	517	0.63	1,883	2.31	81,537	100
1962/63	78,169	96.89	552	0.68	1,957	2.43	80,678	100
1963/64	79,544	96.91	580	0.71	1,949	2.38	82,073	100
1964/65	82,943	96.92	653	0.76	1,986	2.32	85,582	100
1965/66	86,404	97.16	643	0.72	1,882	2.12	88,929	100

Lower percentages will be found for the rural grammar schools and grammar schools for employed persons, in part because these schools, unlike the 8-year regular general secondary schools comprised only 5 and 6 years respectively during the period covered.

3. Teacher training and the new grammar school for future teachers as an avenue to higher education

In the past decade and a half, the secondary school for teacher training has played a special role in opening up to late starters the path to the university. This is a five-year school which follows the eighth grade of compulsory schooling and which combines general secondary education with professional teacher training. Since 1950, the leaving certificate of this school - whose functions are now being taken over by other school types as described below - has been the equivalent of the science grammar school diploma, thus conferring the right to enter higher education. A portion of the graduates have taken advantage of this right, although the majority have entered the teaching profession as primary school teachers.

The enrolments of these schools have risen steadily and while a part of the inflow is composed of pupils who have transferred from the general secondary school after the fourth grade (end of the lower division), increasing numbers have come from the upper primary and ordinary primary schools, especially in rural areas. These primary school leavers are required to take an entrance examination. (Unfortunately, statistics on the previous schooling of the pupils have been maintained only since 1963/64).

Under the School Organisation Act of 1962, the role of this school in providing general secondary education is being taken over by the new grammar school for future teachers

(Musisch-Pädagogisches Realgymnasium-G.III 5), while the professional teacher training functions are being assumed by a new type of third-level teacher training college.(1) As the new grammar schools for future teachers opened their doors in 1963/64, and the old-type secondary schools for teacher training are releasing their last classes in 1967, there is a period of overlapping. Hence in the tables on the following pages, enrolment figures for 1963/64 and 1964/65 will encompass both types of schools.

To begin with it should be noted that from 1963 to 1965/66, 82 to 85 per cent of the new enrolment to the grammar school for future teachers has been drawn from the upper primary schools, while between 9 and 11 per cent came from general grammar schools. Primary or other schools supplied the remaining 6 or 7 per cent.

Table 8

Source of recruitment to grammar schools mainly for future teachers

Came from:	1963/64	1964/65	1965/66
General grammar school	206	278	291
Upper primary school	1,974	2,044	2,152
Primary school	72	72	59
Other schools	50	93	94
Total	2,302	2,487	2,596

Other data concerning this inflow is also highly significant. For example, applications for admission during this period may be broken down:

Pupils who:	1963/64	1964/65	1965/66
Applied for admission	2,858	2,949	3,044
Were accepted	2,302 (80.55%)	2,487 (84.33%)	2,596 (85.28%)
Were not accepted for lack of space	237 (8.29%)	206 (6.99%)	94 (3.09%)
Failed entrance examination	319 (11.16%)	256 (8.68%)	354 (11.63%)

The comparatively high percentage of pupils who were refused admission for lack of space shows the so-called "pent-up social demand" for education (see Chapter IV).

The following tables show the evolution of inflow and total enrolment over the past decade.

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(1) See Section A4 above.

Table 9

Inflow to the first year of the secondary schools for teacher training (since 1963/64 to the grammar schools mainly for future teachers), as compared to the size of the corresponding age groups

	First-year pupils		Total number of 14-year-olds	
	Absolute	Index 1955 = 100	Absolute in thousands	Index 1955 = 100
1955/56	962	100	128.9	100
1956/57	977	101	113.3	87
1957/58	1,080	112	107.6	83
1958/59	1,284	133	106.9	82
1959/60	1,309	136	89.1	69
1960/61	1,439	149	90.7	70
1961/62	1,749	181	105.6	81
1962/63	1,708	177	107.7	83
1963/64 Grammar school for	2,301	239	102.9	79
1964/65 future teachers	2,487	258	97.5	75
1965/66	2,596	270	94.3	73

Whereas the number of 14-year-olds, who account for the majority of entries into teacher training schools and grammar schools mainly for future teachers, dropped by 25 per cent in the past ten years, the number of entries increased by 158 per cent during the same period. In relative terms, therefore, the number of entries can be said to have tripled.

Table 10

Enrolment of the secondary schools for teacher training (including the courses for secondary-school leavers) since 1963/64, combined with the enrolment of the new grammar schools mainly for future teachers

	Number of pupils		Total number of 14-18-year-olds	
	Absolute	Index 1955/56 = 100	Absolute in thousands	Index 1955/56 = 100
1955/56	4,012	100	548.0	100
1956/57	4,144	103	578.6	105
1957/58	4,411	109	598.7	107
1958/59	4,616	115	588.8	107
1959/60	4,971	123	544.2	99
1960/61	5,496	137	506.7	92
1961/62	6,258	156	499.5	91
1962/63	6,965	173	499.3	91
1963/64 including grammar schools	8,125	202	495.2	90
1964/65 for future teachers	9,096	226	503.8	91
1965/66	10,229	255	507.5	93

Up to 1957/58 the size of the age groups eligible for study at teacher training schools increased, but since then has decreased (although in 1964/65 a slight upswing was observed). A comparison of total enrolments with the sizes of the age group shows strongly increasing enrolments in relative terms. Since the entry into force of the School Organisation Act of 1962, the inflows - now to the newly created grammar schools mainly for future teachers - have given rise to a still sharper increase in enrolments.

Table 11

Output of the secondary schools for teacher training

Year	Regular 5-year course at the secondary schools for teacher training	1-2 year courses for secondary school leavers (1)	Total	Index: 1955 = 100		Number of 19-year olds in the total population	
				Regular 5-year teacher training course only	Total	Absolute in 1000s	Index 1955 = 100
1955	626		626	100	100	82.2	100
1956	670		670	107	107	81.2	99
1957	601		601	96	96	86.3	105
1958	853		853	136	136	116.2	141
1959	786		786	126	126	133.3	162
1960	779	80	859	124	137	127.9	156
1961	782	147	929	125	148	112.7	137
1962	761	307	1,068	127	171	107.4	131
1963	957	334	1,291	153	206	106.7	130
1964	1,079	425	1,504	172	240	88.8	108
1965	1,054	544	1,598	168	255	90.4	110
1966	1,300	800	2,100	208	335	105.3	128

(1) Since 1959 courses for secondary school leavers (Maturantenlehrgänge) have been conducted at the teacher-training schools; these are courses in which graduates of general secondary school are trained as primary school teachers.

Up to 1962 the output of graduates from teacher training schools, considered as a proportion of the relevant age group, declined. Since then, it has been rising sharply, and will continue to rise: see the development of enrolment in Table 10.

4. Access to higher studies through secondary vocational education

Access to higher education - normally limited to study in certain fields - may also be had by graduation from a secondary vocational school. The main types of these schools are described below.

(a) Business academies

Whereas by passing the leaving examination at a grammar school or a teacher-training school the student acquires an unlimited right to enroll at an institution of higher education, the leaving certificate of a business academy limits him to enrolment at the School of Commerce (Hochschule für Welthandel). But by taking an additional examination - the supplementary school-leaving examination (Ergänzungsmatura) - he can also acquire an unlimited right to study at institutions of higher education. On the other hand, graduates from general grammar schools may obtain the leaving certificate of a business academy in a two-year commercial course for grammar school graduates - (Abiturientenkurs).

The leaving certificate of a business academy is moreover equivalent to the journeyman's examination (Gesellenprüfung) in a commercial field and entitles the holder to conduct a business provided he can give proof of at least one year's experience in that field. The business academy is an upper division school (V III 5); in 1956/57, approximately 65 per cent of its first year pupils were upper primary school leavers, 38 per cent came from grammar school, and the rest from other schools (senior division of ordinary primary schools or pupils who would have had to repeat a grade at other schools). But the distribution has been changing in favour of upper primary school pupils, who in 1964/65 represented 73.11 per cent of the first-year pupils.

This development is shown in the following table.

Table 12

Previous schooling of pupils in the first year of business academies and of total enrolment in business academies

School year	Inflow					Enrolment					
	Pupils in the first year of business academies					School year	Total enrolment in business academies	Their distribution as to previous schools			
	Total	Their distribution as to previous schools						Upper primary school		General secondary school	Other schools
		Upper primary school		General secondary school	Other schools						
		Absolute	%	Absolute	Absolute			Absolute	%	Absolute	Absolute
1956/57	2,526	1,633	64.64	810	83	1956/57	7,598	4,544	59.80	2,912	142
1957/58	2,658	1,702	64.03	853	103	1957/58	8,038	4,800	59.71	3,066	172
1958/59	2,638	1,762	66.79	811	65	1958/59	8,051	4,993	62.01	2,900	158
1959/60	2,402	1,509	62.82	761	132	1959/60	7,807	4,791	61.36	2,730	286
1960/61	2,132	1,421	66.65	628	83	1960/61	7,876	4,640	58.91	3,008	228
1961/62	2,538	1,715	67.57	748	75	1961/62	7,742	4,549	58.75	2,972	221
1962/63	2,627	1,884	71.71	657	86	1962/63	7,515	4,528	60.25	2,767	220
1963/64	1,973	1,469	75.83	442	62	1963/64	6,985	4,359	62.40	2,426	200
1964/65	1,986	1,439	73.11	475	72	1964/65	6,919	4,416	63.82	2,315	188
1965/66	1,919	1,436	74.83	444	39						

In the next table, the total enrolments are converted into index numbers and the progression of the enrolments is juxtaposed to that of the relevant age group.

Table 13

Business academies: Evolution of enrolment compared with that of relevant age group

	Enrolment		All 14-17 year olds	
	Absolute	Index 1955/56 = 100	In thousands	Index 1955/56 = 100
1955/56	6,891	100	466.8	100
1956/57	7,598	110	492.3	106
1957/58	8,038	117	482.5	103
1958/59	8,051	117	455.5	98
1959/60	7,807	113	416.3	89
1960/61	7,876	114	394.0	84
1961/62	7,742	112	392.1	84
1962/63	7,515	109	392.6	84
1963/64	6,985	101	406.4	87
1964/65	6,978	101	413.4	89
1965/66	6,647	97	402.2	86

The absolute number of students shows considerable fluctuations as a result of demographic factors. A comparison of the enrolment indices with the size of the corresponding age group shows that enrolment has risen slightly relative to the age group.

Finally, the development of output of the business academies in the past decade is shown in Table 14.

Table 14 also shows an increase of the absolute number of graduates up to 1961. Since then a decrease has been observed which cannot be explained by demographic factors alone.(1)

(b) Secondary technical and trade schools

The five-year federal technical and trade schools (up to 1963 known as "Bundesgewerbeschulen") are institutions for the training of gifted young people for careers in higher technical service in industry and state undertakings as technicians and draughtsmen. They enter these fields of employment immediately after taking their final school examinations. This examination entitles them to receive certain rights and privileges in one or more respective trades. The course is normally completed by taking a leaving examination which gives access to higher studies in the same or a related discipline. In certain cases the taking of supplementary examinations is necessary, just as in the other upper divisions of secondary schools. Before the 1962 School Organisation Act, those school leavers who intended to go on to university were restricted in their choice of studies within the Faculty of Engineering.

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(1) See "Bildungsbericht 1965", (1965 Report on Education).

Table 14

Output of the business academies

Year	Graduates of the:					Total number of 18-year-olds (17:8 - 18:7)	
	Regular 4-year business academies (a)	Commercial courses for grammar school graduates	Total	Regular 4-year business academies only	Total	Absolute numbers in 1000s	Index 1955 = 100
	Cardinal number			Index			
	1	2	3	4	5	6	7
1955	610	330	940	100	100	81.7	100
1956	741	270	1,011	121	107	86.7	106
1957	998	230	1,228	164	130	116.5	143
1958	1,517	320	1,837	249	195	133.5	163
1959	1,524	360	1,884	250	200	128.1	157
1960	1,442	430	1,872	236	199	122.8	138
1961	1,538	400	1,938	252	206	107.4	131
1962	1,551	430	1,981	254	211	106.9	131
1963	1,260	380	1,640	207	174	88.8	109
1964	1,135	310	1,445	186	154	90.5	111
1965	1,367	221	1,588	224	169	105.4	129

(a) Being expanded to five years under the 1962 School Organisation Act.

The three tables below trace the following developments over the past decade: the total enrolment of the secondary technical and trade schools; the changing distribution of their entering pupils according to type of previous schooling; and, lastly, the development of output compared with the evolution in the size of the relevant age group in the total population.

The organisational unity of the secondary technical and trade schools specialising in technological subjects with the intermediate-level technical schools forming their lower divisions does not permit a separate listing of enrolments in the following tables. The increase in the number of pupils since 1955/56 is evident. It is not possible to provide a comparison with the corresponding age groups, as the schools comprise three, four or five years, and are therefore attended primarily by the age groups 14-17, 14-18 and 14-19. Moreover the students of schools and classes for master craftsmen are adults belonging to various age groups.

Table 15

Enrolment in the secondary technical and trade schools, the intermediate technical, trade and arts-and-crafts schools, the schools for master craftsmen, foremen and construction workers and the classes for master craftsmen

School year	Enrolment in secondary technical and trade schools and intermediate-level trade, technical and arts-and-crafts schools	Enrolment in schools for master craftsmen, foremen and construction workers, and in classes for master craftsmen	Total
1955/56	11,868	1,255	13,123
1956/57	12,836	1,303	14,139
1957/58	13,781	1,401	15,182
1958/59	14,935	1,655	16,590
1959/60	14,806	1,757	16,563
1960/61	14,506	1,963	16,469
1961/62	14,632	1,884	16,516
1962/63	14,955	1,926	16,881
1963/64	15,525	1,403	16,928
1964/65	15,584	1,525	17,109
1965/66	16,020	1,569	17,589

Table 16

Previous schooling of students admitted to secondary technical and trade schools and intermediate-level technical, trade and arts-and-crafts schools(1)

School year	Of the following numbers who enrolled for the first time in the first-year classes		The following came from:				Total enrolment in the first-year classes
			Compulsory schools		The lower division of secondary schools		
	Absolute	%	Absolute	%	Absolute	%	
1955/56	3,701	100	2,551	68.92	1,150	31.08	4,044
1956/57	3,583	100	2,495	69.63	1,088	30.37	3,824
1957/58	3,773	100	2,599	68.88	1,174	31.12	4,004
1958/59	4,305	100	3,067	71.24	1,238	28.76	4,643
1959/60	4,017	100	2,913	72.51	1,104	27.49	4,315
1960/61	3,991	100	2,934	73.51	1,057	26.49	4,309
1961/62	4,235	100	3,105	73.31	1,130	26.69	4,633
1962/63	4,527	100	3,395	74.99	1,132	25.01	4,896
1963/64	4,746	100	3,619	76.25	1,127	23.75	5,036
1964/65	4,026	100	3,024	75.11	1,002	24.89	4,770
1965/66	4,127	100	3,141	76.11	986	23.89	4,935

(1) The table above shows a distinct trend in favour of entering pupils coming from the compulsory schools. From 1955 to 1964 there has been a rise of over six per cent in the proportion of new pupils recruited from the compulsory schools and a corresponding decline in the proportion transferring from the general secondary schools.

Table 17

Output of secondary technical and trade schools

Year	Secondary technical and trade schools	Secondary technical and trade schools for employed persons	Total	Index 1955 = 100	Index of all 19-year-olds, the age group accounting for the majority of the graduates
1955	795		795	100	100
1956	773		773	92	99
1957	946		946	119	105
1958	1,247		1,247	157	141
1959	1,444		1,444	182	162
1960	1,577		1,577	198	156
1961	1,531	98	1,629	205	137
1962	1,563	58	1,621	204	131
1963	1,535	75	1,610	203	130
1964	1,506	83	1,589	100	108
1965	1,464	98	1,562	196	110

The output of the secondary technical and trade schools has risen considerably since 1955/56. The decline in absolute figures since 1961 is due to demographic factors. The number of graduates as a proportion of the relevant age group will continue to rise, partly as a result of the construction of new schools.

(c) Secondary schools for women's domestic and catering occupations

The leaving certificate of the secondary school for women's domestic and catering occupations - formerly intended as a proof of qualification for a higher domestic or catering occupation - has, since 1963/64, entitled the graduate to enrol at the Institutes for Translators (Dolmetsch-Institute) at the universities (a provisional right of enrolment was first granted in 1961/62). By taking a supplementary examination, the student can acquire the unlimited right to enrol at an institution of higher education. The following table shows the development of the output of this type of school since 1955. A rising trend may be observed. The decrease from 329 (1962) and 255 (1963) and 218 (1964) is due to the demographic development.

Table 18

Output of the secondary schools for women's domestic and catering occupations

Year	Graduates		Total 18-year-olds (17 years 8 months - 18 years 7 months	
	Number	Index 1955 = 100	Number, in thousands	Index 1955 = 100
1955	148	100	81.7	100
1956	182	123	96.7	106
1957	280	189	116.5	143
1958	264	178	133.5	163
1959	329	222	128.1	157
1960	275	186	112.9	138
1961	311	210	107.4	131
1962	329	222	106.9	131
1963	260	176	88.8	109
1964	218	147	90.5	111
1965	287	194	105.4	129

5. The performance of the various school types providing access to higher education

Before discussing the enlarged possibilities of access to higher education created by the 1962 School Organisation Act, we can summarise developments up to the present time as follows:

(a) The "main stream" leading to the universities (the general secondary school) has been growing constantly during this century. Before 1927 the increase was accounted for by the "source" alone: i.e.,the inflow of pupils from primary schools who passed the entrance examination to the first year of the general secondary schools at the age of 10 or 11. As we have seen, after 1927 a "tributary" joins the main stream (transfer possibilities from upper primary school to the general secondary school); the effectiveness of this tributary has so far, however, as far as general grammar schools are concerned, been strikingly stable and strikingly low.

In surveying the development of the "main stream", we can observe a considerable increase in enrolment in the general secondary schools, both in absolute figures and in terms of participation of the relevant age group. This is shown in the table below:

Table 19

General grammar school (since 1963 general secondary school) enrolment as a percentage of the 10-17 year-old age group

Year	Total 10-17 year-old age group	Enrolment of general grammar schools (since 1963 general secondary schools)(1)	
	In thousands	In thousands	As a percentage of age group
1950/51	771.1	50.3	6.52
1955/56	884.4	74.8	8.46
1960/61	808.3	79.2	9.80
1965/66	789.2	87.0	11.02

(1) This table only shows the number of pupils in the 10-17 year old age group; young and older pupils are not included.

(b) Apart from the "main stream", however, there is a whole system of other paths to higher education, which is gaining increasing importance. These paths comprise the old secondary schools for teacher training (and now the grammar schools mainly for future teachers), the business academies, the secondary technical and trade schools, and the secondary schools for women's domestic and catering occupations. These are all "upper-division types" without lower divisions. A minority of the pupils come from the lower divisions of grammar schools. The majority are recruited from upper primary schools, and a small number come from the senior division of primary school.

As will be seen in the following tables 20-23, and summarised in Table 24, in 1966/67, 98 per cent of the 8,800 pupils entering the non-specialised secondary schools, which have provided the major access to higher education, came from the lower division of these schools themselves, while about 88 per cent of the 24,000 pupils entering all other types of secondary and intermediate schools were recruited from the primary and upper primary schools. The "other ways" to higher education represented in this latter group are of particular importance with a view to the expected future development of the Austrian school system; this is underlined, furthermore, by developments in other European countries.(1)

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(1) E.g. in the Federal Republic of Germany. See the brochure "Ingenieurschulen, Neuordnung, Ausbau 1962/70" (Engineering Schools: Reorganisation, Extension, 1962/70), published by the Standing Conference of the Ministers of Education of the Länder of the Federal Republic of Germany, Ernst Klett Verlag, Stuttgart, 1965.

Table 20

Pupil inflow into first forms of secondary and intermediate schools, 1966/67

Schools of origin

Secondary schools giving general access to higher education

Pupils transferred to (receiving schools):	Pupils transferred from (schools of origin):									
	8th form primary schools		4th form upper primary schools		4th form general secondary school leading to higher education		Other schools		Total	
	N	%	N	%	N	%	N	%	N	%
5th forms of the grammar schools mainly for future teachers	74	2.47	2,520	84.03	385	12.84	20	0.66	2,999	100
5th forms of secondary schools without special categories			158	1.79	8,681	98.21			8,839	100
5th forms of secondary schools giving access to higher education	74	0.63	2,678	22.62	9,066	76.58	20	0.17	11,838	100

Note: Mention should be made of the fact that the total sum of the figures in Tables 20-23 does not agree with the number of pupils in the first form of the corresponding intermediate or secondary types of schools. This is due to the fact that numbers of repeaters of their own school and those of a similar school who have been accepted into the first form without entrance examination were not considered.

Table 21

Pupil inflow into first forms of secondary and intermediate schools, 1966/67

Schools of origin

Secondary and technical vocational schools

Pupils transferred to (receiving schools):	Pupils transferred from (schools of origin):									
	8th form primary schools		4th form upper primary schools		4th form general secondary school leading to higher education		Other schools		Total	
	N	%	N	%	N	%	N	%	N	%
1st forms of secondary technical and trade training establishments .		2,381	73.20		798	24.53	74	2.27	3,253	100
1st forms of business academies	14	0.59	1,791	76.12	505	21.46	43	1.83	2,353	100
1st forms of secondary training for women's domestic and catering occupations	6	1.09	461	83.67			84	15.24	551	100
Secondary technical and vocational schools. . . .			4,653	75.57	1,303	21.16	201	3.27	6,157	100

Table 22

Pupil inflow into first forms of secondary and intermediate schools, 1966/67

Schools of origin

Intermediate vocational schools

Pupils transferred to (receiving schools):	Pupils transferred from (schools of origin)									
	8th form primary schools		4th form upper primary schools		4th form general secondary school leading to higher education		Other schools		Total	
	N	%	N	%	N	%	N	%	N	%
Trade and technical vocational schools . .		1,412	79.41		205	11.53	161	9.06	1,778	100
Commercial schools . . .	234	3.80	5,550	90.4	306	4.97	67	1.09	6,157	100
Vocational schools for women's domestic and catering occupations .	1,681	26.47	4,429	69.74			241	3.79	6,351	100
Intermediate vocational schools		13,306	93.14		511	3.58	469	3.28	14,286	100

Table 23

Pupil inflow into first forms of secondary and intermediate schools, 1966/67

Schools of origin

Intermediate schools for teacher training

Pupils transferred to (receiving schools):	Pupils transferred from (schools of origin)									
	8th form primary schools		4th form upper primary schools		4th form general secondary school leading to higher education		Other schools		Total	
	N	%	N	%	N	%	N	%	N	%
Schools for kindergarten teachers .	28	5.98	377	80.56	49	10.47	14	2.99	468	100
Schools for the training of women handicraft teachers	36	12.63	216	75.79	14	4.91	19	6.67	285	100
Intermediate schools for teacher training	64	8.50	593	78.75	63	8.37	33	4.38	753	100

Table 24

Total pupil inflow to secondary and intermediate schools and percentage of their origin from primary and general secondary schools 1966/67

Receiving Schools	Pupil inflow	From primary and upper primary schools	From general secondary schools
	Number	%	%
1. Secondary grammar mainly for future teachers	2,999	84.03	12.84
2. Secondary technical vocational	6,157	75.57	21.16
3. Intermediate vocational	14,286	93.14	3.58
4. Intermediate teacher training	753	78.75	8.37
Total for teacher, technical and vocational	24,195	87.66	9.35
Secondary without special categories	8,839	1.79	98.21

(c) The following table sums up the performance of the entire system of paths leading to higher education between 1955 and 1964 in terms of the development of the total output of graduates.

It can be seen from this table that the number of graduates increased from 1955 to 1962, but has declined since then. It is difficult to compare these figures with the population figures for the relevant age groups, since the length of schooling varies with the type of school.

Table 25

Total of all graduates from secondary schools providing access to higher education(1)

Year of leaving examination	Absolute number	Index 1955 = 100
1955	5,125	100
1956	5,443	106
1957	7,674	150
1958	9,993	195
1959	11,004	215
1960	11,120	217
1961	11,465	224
1962	11,700	228
1963	10,662	208
1964	9,830	192

(1) From:

- general secondary schools (including rural grammar schools and grammar schools for employed persons;
- secondary schools for teacher training; business academies;
- secondary technical and trade schools;
- secondary schools for women's domestic and catering occupations;

including the special students of all these schools.

It can be seen from this table that the number of graduates increased from 1955 to 1962, but has declined since then. It is difficult to compare these figures with the population figures for the relevant age groups, since the length of schooling varies with the type of school.

Despite these difficulties, however, an attempt is made in Table 26 to give a general idea of the development of output relative to size of age group. This is done by determining, as an average figure, the percentage of 18-year-olds (the group accounting for the bulk of graduates) in each of various birth cohort groups who have received secondary school diplomas. It will be seen that over a 12-year period the ratio of graduates to total age group rose from 6.6 per cent to 11.1 per cent.

Table 26

Percentage of secondary school graduates in the relevant age group

	18-year-olds belonging to the following birth cohorts			
	1933-1936	1937-1940	1941-1944	1945-1948(1)
General grammar schools	3.7	3.8	6.1	6.0
Secondary schools for teacher training . .	0.9	0.7	0.9	1.8
Secondary technical and trade schools . . .	0.9	1.0	1.5	1.7
Business academies	1.0	1.2	1.7	1.6
Secondary schools for women's domestic and catering occupations	0.1	0.2	0.3	0.3
Total	6.6	6.9	10.5	11.4

(1) Partly estimates.

C. The 1962 School Organisation Act: A Broad New Framework for Discovering and Developing Untapped Talent Reserves

Having traced the structural reforms carried out in the past and evaluated their effectiveness, we are now in a position to show how the 1962 School Organisation Act consolidates and reinforces the above-mentioned development of the Austrian school system - i.e. the increased inflow to the schools leading to higher education in general, the improvement of transfer possibilities from upper primary school (or from the senior division of the ordinary primary school) to these schools, and the increasing importance of the so-called upper division types of school as well as of the other paths to higher education. Section 3 of the 1962 Act asserts the democratic principle that all existing educational facilities (including the institutions of higher education) should be open to all capable persons. It reads as follows:

> "The Austrian school system shall be uniform in structure. The structural division of the Austrian school system shall be determined by the various levels of age maturity, the different talents of the pupils, their different tasks in life, and their future occupations. All pupils possessing the necessary qualifications shall have the opportunity to acquire a higher education and to transfer from one school to another".

The principle of "bridges and crosslinks" (or - to express it differently - the principle that dead ends in education must be avoided) is laid down in general terms in the section quoted above. The specific ways in which the 1962 Act prepares the ground for implementing this principle more effectively than in the past are spelled out in other sections. Among the more important provisions in this respect are the following:

1. Measures to facilitate transfers to general secondary school

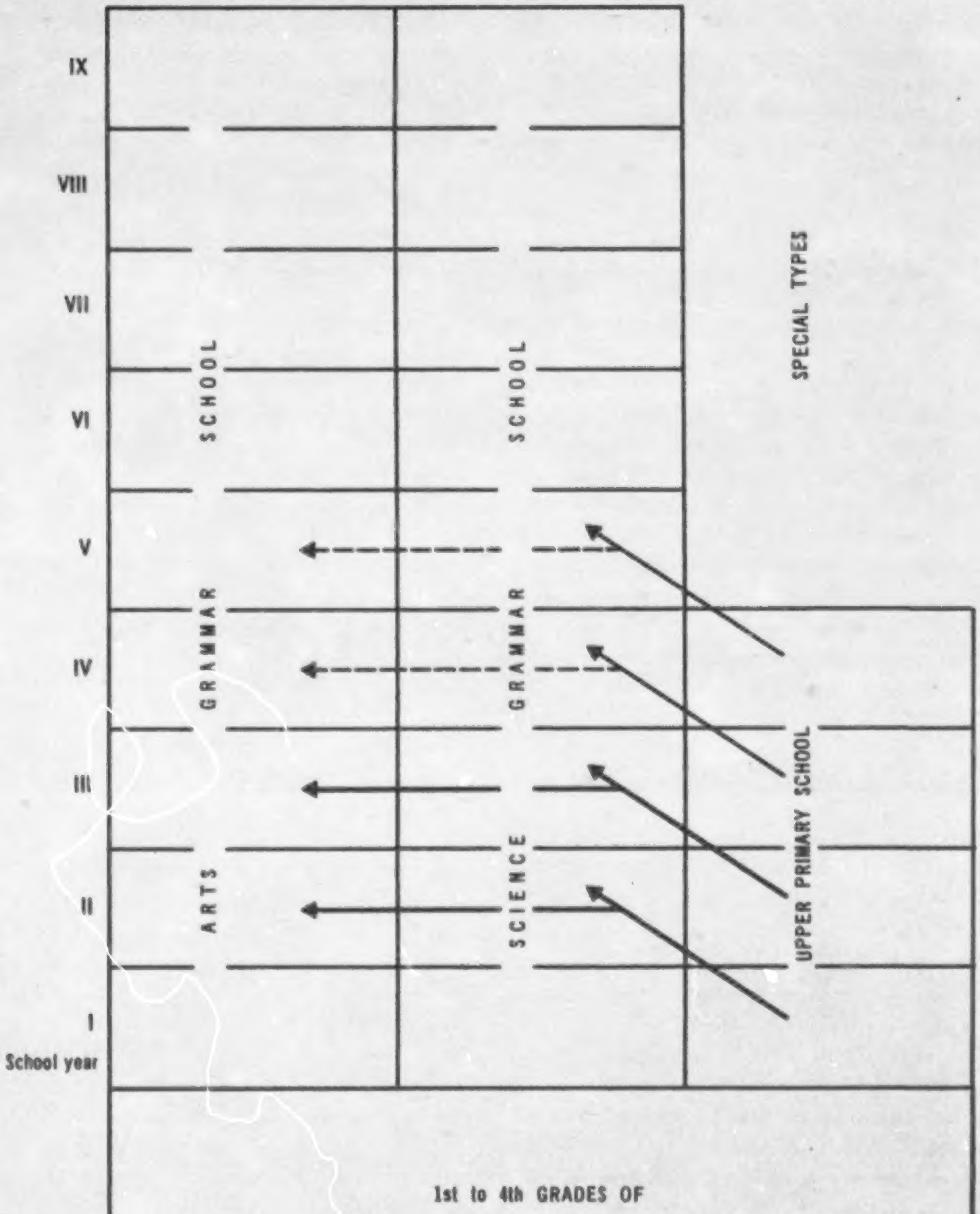
Capable upper primary pupils (first-stream pupils where there are two streams) whose annual reports show satisfactory results (in accordance with the regulations governing grade classification) and who have been successful in their foreign language studies may, as in the past, transfer without examination to the next grade of a general secondary school in which the same language is taught. But the 1962 law goes farther than earlier legislation in facilitating such transfers. Not only does it lay down the principle that differences in curriculum between the upper primary and the general secondary schools must not be such as to impede movement from one to the other, but the reforms which it has effected in the structure of the general secondary schools serve to remove a number of previously existing obstacles to transfer.

Of particular relevance in this connection is the fact that in the new science grammar school no Latin is taught in the first division (first four grades) and that the curriculum of this division roughly corresponds to that of the upper primary school. Thus a pupil who has not begun the study of Latin in the upper primary school will not for that reason be prevented from transferring to a science grammar school.

Diagram II may serve to illustrate the meaning of the term "bridges and crosslinks from upper primary school to general secondary school". (The diagram and the text which follows it are taken from an essay by Dr. Otto Timp and Leo Leitner, "Die allgemeinbildende höhere Schule" (The General Secondary School), Pädagogische Mitteilungen, 1962, pages 70 ff.)

Diagram II

ILLUSTRATION OF THE TRANSFER POSSIBILITIES FROM UPPER PRIMARY SCHOOL TO GENERAL SECONDARY SCHOOLS


IX
VIII
VII
VI
V
IV
III
II
I
School year
ARTS GRAMMAR SCHOOL
SCIENCE GRAMMAR SCHOOL
SPECIAL TYPES
UPPER PRIMARY SCHOOL
1st to 4th GRADES OF
PRIMARY SCHOOL

"This illustration shows that transfers (under the conditions described above - School Organisation Act 1962, section 40, paragraph 3) to the second and third-year classes of all types of lower division are possible without difficulty (heavy lines). Transfer to the fourth and fifth classes of arts grammar school types (Latin from the third class onwards) will be very difficult unless the successful tuition in Latin at an upper primary school can be proved (dotted lines). Transfers to the fourth and fifth classes of science grammar school types (light lines) do not usually present great difficulty, but experience has shown that transfers to these grades are far less successful than those to lower grades.

"Special secondary school types are only indicated in this table since upper primary school pupils do not transfer to them but do enter them".

2. The obligation for all capable pupils to attend upper primary school

While the structural and curriculum changes described above should ease the way for transfers from upper primary to general secondary school, another provision of the 1962 law is aimed at broadening the recruitment base of the upper primary school itself. The new legislation makes it obligatory for all pupils who are considered capable of following the course at the upper primary school to switch to such a school after the fourth grade, rather than staying in an ordinary primary school for the remainder of their primary education. Thus, especially in rural areas, many 10-year-olds who otherwise might never have gone beyond compulsory schooling will now be placed in a better position to join the stream to general secondary and higher education. The obligation to attend an upper primary school, however, is contingent upon the availability of such an establishment in the pupil's area of residence; therefore, the real efficacy of this measure will in many cases depend upon the carrying out of an adequate school building programme or the provision of the necessary school transport facilities.

3. Expansion of grammar school education specially designed for late starters

As already noted, the creation of special forms of grammar school which begin only after completion of compulsory schooling - and thus have the purpose of bringing late starters into the stream leading to higher education - dates back to the legislation of 1927. The two school forms of that type established in 1927 - the rural grammar school and the grammar school for employed persons - have been given a new legal framework under the 1962 Act, with the duration of their study programmes being extended by one year (to six and five years respectively).

The most promising of the special grammar school forms, in terms of possible enrolment growth, however, was newly created by the 1962 law: this is the grammar school mainly for future teachers, which was described above as having taken over and expanded the significant role already played by the old type of secondary school for teacher training in opening the way for late starters, especially from rural areas, to higher education.(1) The five-year grammar school mainly for future teachers is a true general secondary school, without an upper division, designed specially to receive pupils directly from the upper primary (or ordinary primary) school. The volume of the influx to these schools in their first two years of operation (as well as the pent-up demand indicated by the rejections for lack of space) has already been indicated.(1) It may be added here that since 1963, 42 schools have been created - 11 of them in places other than those in which the former type of teacher training school already existed.

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(1) See section B3 above.

4. Expansion of secondary vocational education

The "other ways to higher education", i.e. the secondary vocational schools, were expanded considerably as a result of the 1962 School Organisation Act which provided the legal basis for their special forms. The five-year business academies for employed persons and the four-year secondary technical and trade schools for employed persons (apart from the main types of these secondary vocational schools) have opened the way to higher education for talented persons who are already employed.

In reviewing the reforms set in motion by the School Organisation Act from the point of view of enhancing accessibility to higher education, it can be noted that during the period under consideration developments and trends have been taken into account and carried further, since this legal foundation, expressing the will of the great majority of the Austrian people, assures that these trends can continue to develop.

The intentions of the legislature are clear. At the Fifth Conference of the European Ministers of Education, the Austrian Federal Minister of Education, Dr. Theodor Piffl-Perčević, in introducing the Austrian study on continued education, interpreted these intentions as follows:

> "In (passing the 1962 School Organisation Act), the Austrian Parliament went back to a basic principle of Austrian educational tradition - to the principle of promoting the capable. No talent shall be lost and the road to higher education shall be open to all capable persons. This means that capable children must at an early stage have the opportunity of choosing their own way; it also means - and I want particularly to emphasise this - that later on, that is, at significant stages of the educational path right up to the university, all capable persons must have the opportunity of selecting a stream leading to higher education".

D. Summary - Development of the Stream Leading to Higher Education and the Future Perspective

This chapter, after describing the present organisation of the Austrian school system, analyses the structural reforms that have been carried out during the past 40 years with a view to making higher education accessible to a larger proportion of the nation's youth. It further indicates, on the basis of the relevant statistical data, the extent to which these reforms have been effective up to the present time. The likely future development of the stream leading to higher education - a vital factor in determining the educational system's ability to provide the increasing stocks of highly qualified manpower needed by a changing economy - will be shown in Chapter II, which brings together a comprehensive set of detailed projections of Austrian pupil flows over the next decade.

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(1) Ibid.

Development of the Stream Leading to Higher Education

1. The general secondary (grammar) schools

During the first quarter of this century, admission to the grammar school - the sole path to university-type institutions - could be had only by passing an entrance examination voluntarily taken at the age of 10 or 11; failure to meet this requirement meant permanent exclusion from any possibility of university study. While, as we shall see below, subsequent structural innovations have made it possible for late starters to gain entry to grammar school education, admission after the fourth grade of primary school remains the principal path to such schooling. At present (1964), about 14 per cent of all fourth-grade leavers enter grammar schools.

(a) Creation of a transfer bridge to grammar school

In 1927, a tributary was, for the first time, adjoined to this main stream to higher education. Legislation adopted in that year made it possible for capable pupils of a newly created upper primary school (the Hauptschule, g (G) 114), containing the last four primary grades, to transfer, without examination, from any grade to the next grade of grammar school provided they met certain modern language requirements; the right was limited to first-stream pupils in those upper primary schools which had two streams.

After the hiatus of 1938-1945, when German school laws were in force, wider use was made of the transfer possibilities, which were facilitated by making a modern language compulsory in the first stream of the upper primary school. Subsequently, the 1962 School Organisation Act, in laying down the legal foundations of the present Austrian school system, sought further to reinforce the transfer bridge by, inter alia, stating that differences in curriculum between the upper primary and the grammar - henceforth known as general secondary - schools must not be such as to impede transfer from one to the other; these curricular differences were, moreover, reduced by the changes which the 1962 Act effected in the structure of the secondary school, particularly in its lower division. (Here the lower division of the new Realgymnasium deserves special mention, the curriculum of which, like that of the upper primary school, does not include Latin, so that able pupils from the fourth grade of the upper primary school can transfer to the fifth grade of the Realgymnasium). In addition, the Act made it obligatory for competent pupils to take the last four years of their elementary schooling in an upper primary school, rather than remaining in the ordinary primary school, provided an upper primary establishment was available in their area. The full impact of this measure will depend upon the implementation of adequate school construction and school transport programmes.

(b) Limited efficacy of transfer provisions

The efficacy of the transfer link to grammar school education, and hence to the university, has, in fact, proved thus far to be very limited. Only 0.8 per cent of all children who were in upper primary school in 1963 subsequently moved on to a general secondary school.

And the proportion of all general secondary school pupils who had transferred from an upper primary school remained constantly below half of one per cent up through 1965/66. However, this proportion is expected to rise from autumn 1967, when the new legislation concerning the Realgymnasium (Science Grammar School) comes into effect (i.e. when a 5th form is introduced for the first time into this type of school).

2. Special grammar school types for late starters

(a) Rural grammar schools and grammar schools for employed persons

In addition to the bridge from the various grades of upper primary to general secondary school, the 1927 legislation created two special grammar school types which are aimed exclusively at enabling compulsory school leavers, after the eighth grade, to join the stream leading to university education. These establishments - the rural grammar schools and the grammar schools for employed persons - thus comprise only six and five years of study respectively, as compared with the nine-year general secondary schools of the more usual kind.(1)

Although enrolment in these two special school types has risen rather rapidly in recent years, it is not very significant numerically. In terms of output, for every 100 graduates of the more widespread type of general secondary school in 1964, there were only about three graduates of the grammar schools for employed persons and one graduate of the rural grammar schools.

(b) The new grammar school mainly for future teachers

The most promising special school type - especially from the standpoint of increasing rural participation in the higher educational levels - is the grammar school mainly for future teachers, created by the 1962 School Organisation Act. This, too, is an exclusively "upper division" school, comprising five years of study after completion of the full eight primary grades. In 1964/65, its second year of operation, this school type had an inflow of 2,487 first-year pupils, compared to total enrolment of 653 and 1,986 for the rural grammar schools and the grammar schools for employed persons respectively. Moreover, nearly 7 per cent of all applicants for admission to the grammar schools for future teachers in that year had to be turned down solely for lack of space - showing the existence of considerable "pent-up demand". The role which these schools may play in the future is briefly discussed in Chapter VI.

3. Secondary vocational education

Existing alongside the various grammar-type schools are the secondary vocational schools, which provide access to study in specific fields in higher education related to the type of secondary schooling pursued. The three main types of secondary vocational school are the technical and trade schools, the business academies, and the secondary schools for women's domestic and catering occupations. It should be mentioned that the possibility of unlimited access to higher education is offered to graduates of all these school types who pass a supplementary school-leaving examination.

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(1) The lengths of study indicated in this paragraph represent, for all the school types mentioned, a one-year extension which is being put into effect under the 1962 School Organisation Act. The first graduates of the new nine-year general secondary school will receive their diplomas in 1972, while the first output of the six and five-year special school types is scheduled for 1968.

While secondary vocational school enrolments doubled during the decade 1950-1960, and have risen another estimated 86 per cent in the five subsequent years, these schools have far fewer pupils than the general secondary schools. Their total enrolment was only about 21,000 in 1964/65, compared to 85,000 for the general secondary schools; in terms of participation ratios, the proportion of, for example, all 16- and 17-year-olds in secondary vocational schools was only an estimated 2.76 per cent and 3.48 per cent, respectively, in 1965/66, as against 9.73 per cent and 8.31 per cent for the general secondary schools.

The Present Situation and a Perspective of the Future

The remarks that follow constitute a brief summary description of the present position regarding access to higher education and a glance ahead at future developments in the context of evolving economic and social requirements. Anticipatory reference will thus be made to some of the subsequent chapters which carry forward the account of Austrian educational development presented in this report.

1. The structural innovations introduced prior to the 1962 School Organisation Act have not, as we have seen, had a very significant effect on the breadth of the main stream leading to higher education - i.e. via grammar-type secondary schooling. Nevertheless, this stream has widened over the years, as can be seen from the fact that participation of the 10-to 17-year-old age group in the general secondary schools(1) increased from 6.52 per cent in 1950/51 to an estimated 11.02 per cent in 1965/66. In terms of output, the proportion of all 18-year-olds who graduated from a general secondary school went up, during the same period, from 4.6 per cent to 7.8 per cent.(2)

2. The 1962 School Organisation Act lays the foundations upon which it will be possible to effect a more rapid broadening of this stream. Some of the relevant provisions of the Act have been mentioned - e.g. the prolongation of compulsory schooling, which will increase the numbers of those eligible to continue their education beyond the primary level and should stimulate the flow to secondary schools; the legal obligation for capable pupils to switch from ordinary primary to upper primary schools after the fourth grade; the structural reforms that serve to reduce differences in curricula between general secondary and upper primary schools, thus tending to facilitate transfer; the creation of the new science grammar school (Realgymnasium), the creation of the grammar school mainly for future teachers, etc.

3. A very considerable widening of the stream to and through the secondary vocational schools is envisaged in view of the urgent need of the economy for vocational graduates and the high demand trend observed for these schools - including considerable pent-up demand

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(1) Excluding the newly established grammar schools for future teachers.

(2) What is, precisely, being compared here is the ratio of 18-year-olds, determined as an average figure for the birth cohorts belonging to the years 1933-1936 and the years 1945-1948. The figures for the latter group are partly estimates.

reflected in the number of applicants rejected for lack of space.

4. A comprehensive picture of the expected flows up to 1975 - in absolute figures as well as in age-group percentages - will be presented in Chapter II. The expansion foreseen in the 2nd Assessment of that chapter - which takes account of social demand trends as well as of demographic developments and the provisions of the 1962 Act - is of considerable magnitude. Yet it will be seen from Chapter III that Dr. Steindl estimates that this expansion will not be sufficient to provide the educated manpower needed by the Austrian economy, and from Chapter IV that full implementation of existing legal provisions and policy objectives is likely to give rise to an effective social demand which is not predictable on the basis of recent trends.

In view especially of the envisaged requirements of the economy, suggestions will be made in Chapter VI for secondary school output targets much more ambitious than those foreseen in the 2nd Assessment - with particular emphasis on the secondary vocational schools.

5. The possibility of meeting such targets will - especially in view of the limited resources available - depend to a large extent on the efficiency of the system. One problem that underlines this fact is that of the high attrition rates in secondary school. Chapter VI will include discussions of such issues as the present methods of selecting pupils for secondary school, the use of programmed teaching, the role of psychological and guidance services, the structure of vocational education, etc.

Chapter II

PROJECTED FLOWS THROUGH THE AUSTRIAN EDUCATIONAL SYSTEM, 1965 - 1975

Introduction and Summary

The previous chapter has traced the structural reforms made in the Austrian educational system during the past four decades and has indicated the extent to which those reforms have affected the performance of the system. Particular attention has been devoted to showing to what degree these structural changes have served to broaden the stream leading to higher education. In the present chapter, an attempt will be made to project the future performance of the system, during the decade 1965-1975; that performance will depend, in large measure, upon the efficacy of the recent comprehensive reforms which are embodied in the 1962 School Organisation Act and are now in the process of implementation.

In order to estimate future performance, two assessments were made of the development of enrolments and output for the decade 1965-1975: one, a conservative "minimum" projection undertaken in 1963/64, and the second a more expansionist estimate made a year later. The main differences between the two projections are that the second takes account of social demand by extrapolating trends observed over the past 12 years and, above all, that it assumes the expansion of intermediate and secondary education will not be impeded by lack of school space. In addition, by the time the 2nd Assessment was made, projects concerning new school types created by the 1962 School Organisation Act had been worked out in greater detail and a number of nation-wide surveys on attrition rates, age structure and wastage rates of teachers, etc. had become available. Thus the 2nd Assessment takes closer account of the behaviour of the school system, and of the social factors impinging upon it, as well as of the specific expansion projects of the educational authorities.

Development of total enrolments

Both primary and secondary school enrolments will mount during the decade 1965-1975, partly as a result of a steady rise in the number of births from 1953-1963 (after which date some tapering off in the size of birth cohorts has been estimated). In addition, the length of obligatory schooling, as well as the duration of many types of secondary school programmes, are being extended by one year.

In the case of the general compulsory schools, the rise in enrolments over the decade under consideration will be about 30 per cent.

At the intermediate and secondary level, the increases are expected to be considerably greater. Enrolment in the intermediate vocational schools should go up by a minimum of 34 per cent, according to the 1st Assessment, and by 64 per cent (in absolute figures from about 26,000 to 42,000), according to the Second. The 2nd Assessment also foresees an increase of as much as 103 per cent (from 21,000 to 43,000) for the secondary vocational schools - which, unlike the intermediate schools, provide access to higher education. In the case of both these school types, the high forecasts are due to a close study of recent strong social demand trends and to provisions of the 1962 School Act looking to an expansion of their present very inadequate capacity.

The general secondary schools should see their present enrolment of roughly 100,000 rise by at least 50 per cent and, in view of the clear trend towards higher education in recent years, perhaps by 68 per cent (2nd Assessment). The new types of teacher training college and establishments for vocational school teachers are just beginning to function; for this reason, and in view of the concrete expansion projects of the Ministry of Education, increases of well over 400 per cent are envisaged - which, in absolute figures, will bring the combined enrolment of these two types of school to somewhat over 5,000 by 1975.

Since the institutions of higher education will not be affected by the demographic wave noted above (from 1947 to 1953 the overall trend in births was downward), their total enrolments are expected to increase by only 3 per cent according to the 1st Assessment. But the 2nd projection, taking rising demand into account, foresees an increase of 27 per cent.

Development of participation rati[illegible]

It has already been made clear that the expected rise in enrolments is due, not only to demographic factors, but also to an anticipated increase in participation ratios. This is shown specifically in a set of tables projecting the percentages of the different age groups enrolled in the various types of schools. Thus, according to the 2nd Assessment, the participation of 16 year-olds in the general secondary schools is expected to go up from 10.48 per cent in 1965/66 to 14.30 per cent in 1975/76, and in the secondary vocational schools from 3.34 per cent to 6.68 per cent.

Similarly, the participation of 20 year-olds in higher education is expected - also according to the 2nd Assessment - to increase from 5.22 per cent to 8.22 per cent during the same period.

Development of total output

Data on output is of vital importance both in view of the needs of the economy for graduates of the various school types and also as a measure of the efficiency of the system. In this connection, it should be noted that the retention rates in the general secondary schools (with respect to first-year entering classes) is only 50.6 per cent. The retention rates for other categories of secondary school will be found in Section A1 of this chapter.

The differences between the 1st and 2nd Assessments for the output of the intermediate vocational schools foresee, respectively, an increase of 21 per cent and 33 per cent. The differences between the two Assessments with respect to the secondary vocational schools are very striking. They assume an increase of 7 per cent and 58 per cent for this type of school.

In both cases, the 2nd Assessment takes into account plans for promoting the expansion of these schools in view not only of rising demand for places, but also the urgent need of the economy for their graduates. With regard to general secondary schools, the 1st Assessment forecasts a rise in output of 52 per cent, and the second, an increase of 70 per cent.

Yet despite the substantial increase envisaged by the 2nd Assessment, it is already clear that the output of secondary schools will be inadequate to cover the requirements of the economy. This will be documented in detail in Chapter III.

The output of the institutions of higher education is expected to go up by 9 per cent or 23 per cent, according to the two respective assessments. These must be considered as only rough estimates since all the information necessary for more precise projection - including the effects of the re-organisation of higher education, which is now in a preparatory phase - is not yet available.

Development of output ratios by age group

One of the important effects of the 1962 Act is expected to be that of raising the proportion of youngsters who complete the full eight grades of compulsory schooling and are thus eligible to continue their education. The introduction of the ninth compulsory year will mean that many repeaters who would normally have completed only seven grades (in eight years spent at school) will now possess a full primary education. An estimated 72 per cent of all 14-year-olds completed the eighth grade in the mid-60's, while some 88 per cent are expected to do so by the end of the decade.

And whereas in the mid-60's an estimated 11 per cent of all 18-year-olds received secondary school diplomas entitling them to enter higher education, the figure will rise by the mid-70's to some 13 per cent according to the 1st Assessment and to 17 per cent according to the second.

With respect to university education, the proportion of the relevant age group receiving first degrees is expected to rise from 4.1 per cent for the birth cohorts 1941-1944 to 4.5 per cent of the birth cohorts 1953-1956.

Main characteristics of university student bodies

A number of studies were carried out in order to provide a clearer picture, for purposes of future planning, of the main characteristics of the university student bodies - e.g. composition by sex, age and social origin, percentage of foreign students, distribution by fields of study, percentage of scholarship holders.

Some of the principal findings are briefly summarised here:

1. Composition by sex

The proportion of female students increased from 21 per cent in 1953/54 to 25 per cent in 1962/63 and has remained stationary at the latter figure up to 1964/65.

2. Proportion of foreign students

The proportion rose from 16 per cent of all students in 1953/54 to a peak of 31 per cent from 1957 to 1959 and has since dropped to 20 per cent in 1964/65.

3. Social origin

A survey of full-time students of Austrian nationality in 1964/65 showed that in 52 per cent of the cases the father's occupation was given as "Employee" (including civil servants and privately employed persons at all levels of responsibility). Only 6 per cent of the students gave "Worker" as their fathers' occupation, while 30 per cent listed "Self-employed" including industrialists, big and small business men, tradesmen, members of the professions, and farmers), and 10 per cent listed "Retired Workers and Employees".

4. Main fields of study

In 1964/65, there were 48,082 full-time students in Austrian universities. Of these, 38,714 were of Austrian nationality. The five fields of study which had the heaviest enrolments of Austrian students were, in order, as follows:

1. Liberal arts including science	11,244
2. Technology	8,401
3. Law and political science	6,930
4. Medicine	4,069
5. Business and commerce	3,943

In 1963/64, of every 100 doctorates awarded to Austrian students, 41 were in law or political science, 25 in the liberal arts, and 19 in medicine - the three fields leading in this respect. Out of every 100 graduates with diplomas (a lower academic qualification than the doctorate), 56 were students of technology and 36 of business and commerce. In general, while the number of doctorates awarded has decreased in recent years (index 100 in 1953/54 to 95 in 1963/64), that of the various diplomas has increased, showing a tendency of many students not to seek to qualify themselves for a profession requiring a doctor's degree.

5. Length of study

The required number of semesters for completing university degree programmes is highly variable; in most liberal arts fields and in law and political science, it is 8; in business and commerce, 6 or 8, depending upon the degree taken; in the majority of engineering fields, 9; and in medicine, 10. But what is almost uniformly true is that the average actual number of semesters taken to graduate exceeds the required number. Thus, in mechanical and electrical engineering, for both of which the required length of study is 9 semesters, the actual number averages in the first case from 10 to 12 and, in the second from 15 to 16. Likewise, in the humanities, the actual duration is 9 semesters, as opposed to the required 8, in the sciences, 9 to 10, instead of 8, etc.

6. Scholarship holders

Of the 38,714 full-time Austrian students in 1964/65, a total of 9,020, or 23.3 per cent had study grants. Of these, 61 per cent had their permanent residence elsewhere than in the locality in which the university was situated.

A. Statistical Basis and Methodology

1. Definition of key terms

Some of the key terms used here and elsewhere in this report are defined below:

Enrolment (E)

= Total number of pupils,

Attrition (A)

= 1. Pupils who leave school during or at the end of the school year without concluding it properly (drop-outs); plus

2. Pupils whose scholastic performance in a given grade fails to meet the required standard (repeaters).

Retention rate (RR)

= Number of graduates of a school as a percentage of the respective inflow at school entry. The group at entry is construed to include repeaters and pupils who have been admitted later than at the normal age, those who have been sent down from a higher grade, and pupils who subsequently transfer to another school.

An accurate calculation of the retention rate requires comprehensive studies over time. Average retention rates for the individual types of school have been calculated here for each year, for groups of years and, as a rule, for ten years of the observation period 1950 to 1964; this has provided a fairly accurate basis of measurement. The retention rates show great variations from year to year and between school types, but certain trends are discernible. It is true, moreover, that retention rates are particularly susceptible to organisational measures (e.g. changes in the curriculum) and to recommendations made by the school authorities (see "1965 Report on Education", page 93).

The retention rates given below, which seem to be fairly accurate, were chosen for the Second Assessment after careful consideration of all pertinent factors.

There are plans for a comprehensive study dealing with attrition and related problems in the Austrian schools. Preliminary studies in this area have already been submitted to the school authorities and to the steering committee of the present Austrian EIP project.

Table 27

Retention rates: secondary schools

General secondary schools	50.6 per cent (counting from the first to the eighth years)
	78.4 per cent (counting from the fifth to the eighth years)
Secondary schools for teacher training	79.5 per cent
Business academies	57.2 per cent
Secondary technical and trade schools	67.9 per cent
Secondary schools for women's domestic and catering occupations	76.5 per cent
Rural arts and science grammar schools	46.0 per cent
Arts and science grammar schools for employed persons	28.0 per cent
Intermediate-level commercial schools	81.0 per cent

2. The basis and nature of the two assessments

Two assessments were made of the expected flows through the Austrian educational system during the decade 1965-1975; the first assessment was carried out in 1963/64, and the second a year later.

Both assessments take into account:

(a) The demographic development of Austria since the end of World War I;

(b) The official educational statistics;

(c) The legal framework of the Austrian educational system;

(d) The estimated effects of the 1962 School Organisation Act;

(e) Ascertainable trends with respect to

  (i) the inflow to the individual types of schools (inflow = I);
  (ii) the production period (= p);
  (iii) attrition (= A);
  (iv) enrolment (= E);
  (v) output (= O);

(f) The school space available.

As will be seen, the first assessment,(1) which is considered to be a minimum projection, seems to point generally to a rather unfavourable development of Austrian educational output.

The second assessment reflects a more optimistic view of the future development of the Austrian school system and takes into account the increased social demand for education.(2) Above all, it was assumed in the second assessment that the expansion of intermediate and secondary schools which is already in progress will not be impeded by lack of school space. Moreover, by the time the Second Assessment was made the projects of the school authorities concerning the new school types[1] created by the 1962 School Organisation Act had been worked out in greater detail. In addition to this material, the results of a number of nation-wide surveys (including public and private schools) initiated and evaluated by the OECD Planning Bureau of the Federal Ministry of Education were used as a basis for the Second Assessment. These surveys included the following:

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(1) The purpose, the methods and the results of the first assessment are discussed in a report of the OECD Planning Bureau of the Federal Ministry of Education: "Statistics and First Future Assessment of the Population (5 to 29 year-old age group), Pupil Inflow, Enrolment, and Output, as well as of the Demand for Teachers in Austria, for the period 1950-1975". (See especially "Notes on the Principles and Methods of Calculation", pages 1-34).

(2) The sociological problems involved in estimating future social demand are discussed in Chapter IV of this report.

(a) In the field of general compulsory education

- Analysis of inflow in the school year 1964/65 (as of 31st December, 1964) to show the percentage of children entering school before, after and at the compulsory school age, as well as the proportion of children who are not educable.[2]
- Determination of the number of repeaters at primary, upper primary and special schools in 1963/64 to show the number and frequency of repetitions and to make possible a more accurate estimate of attrition.
- Determination of the rate of loss (decrease in the number) of teachers in the years 1951, 1956, 1961 and 1963 (loss of teachers due to death or retirement or to notice given by the teacher or the employer, and the use of teachers for special tasks between 1st January and 31st December).
- Determination of the age structure of the teaching staff as of 1st January, 1965 (sizes of the birth cohorts 1898 to 1945 among compulsory school teachers).
- Determination of the available and required school space at primary, upper primary and special schools.

(b) In the field of general secondary education

- Determination of the number of repeaters in the school year 1963/64 to show the number and frequency of repetitions and to make possible a more accurate estimate of attrition.
- Determination of the rate of loss (decrease in the number) of teachers.
- Age structure of teachers at general secondary schools.
- Determination of the available and required school space at intermediate and secondary schools.

(c) In the field of compulsory vocational education

- Determination of the number of repeaters from 1961/62 to 1963/64 as well as of the previous schooling of entering pupils in 1963/64.
- Determination of the rate of loss (decrease in the number) of teachers.
- Determination of the age structure of the teaching force as of 1st January, 1964 (sizes of the birth cohorts 1898 to 1945 among the teachers at compulsory vocational schools).

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[1] The new type of teacher training college, the grammar school mainly for future teachers, the polytechnic course, etc. See Chapter I, Section A4.

[2] As already indicated, the "BG" annotations in parentheses refer to published reports issued by the OECD Planning Bureau of the Federal Ministry of Education.

(d) In the field of intermediate and secondary vocational education

- Determination of the number of repeaters from 1961/62 to 1963/64
  - at commercial schools and business academies;
  - at trade, technical and arts-and-crafts schools and at secondary technical and trade schools;
  - at intermediate and secondary schools for women's domestic and catering occupations.
- Determination of the rate of loss (decrease in the number) of teachers.
- The age structure of the teaching force at intermediate and secondary vocational schools.

(e) In the field of teacher training

- Determination of the number of repeaters in the school year 1963/64.

A number of the studies cited above - on age structure and wastage rates in the teaching force and on available and required school space - were used in making the projections of resource requirements summarised in Chapter V.

3. Methods used in the Second Assessment

Any assessment of the future demand for teachers, school space and funds must be based on an estimate of the prospective number of pupils. This in turn necessitates an analysis of demographic developments, of the educational projects envisaged by the school authorities and of past developments in this field. The relevant trends observed so far (with reference, e.g. to the inflow to the various school types and the demand for their graduates) have been extrapolated and taken into consideration in projecting future flows through the school system.

Various methods may be employed for such a calculation. Theoretically, it is possible to follow every age group from school entry along its path through the educational system. Thus, for example, the number of pupils not accepted, the number of transfers to special schools and the number of repeaters would have to be calculated, using as the point of departure the number of entries to the first grade of primary school. In the following school year the pupils repeating the second grade would have to be added to those who have successfully completed the first grade.

The farther one continues along this line the more complex the method becomes, because the higher the grade, the greater the number of pupils who belong to different age groups. This method is rendered even more complicated by the fact that the sizes of the various age groups differ considerably.

Another method proves to be more practical. This method, which requires the existence of school output data for previous cohorts, was chosen for this study; it is demonstrated here with the secondary schools serving as an example.

It was possible to determine the number of secondary school graduates as a percentage of a given age group for all types of secondary schools and for the various birth cohorts by means of the data available in the school statistics. Table 26a (1st Assessment) presents a survey of this development for the birth cohorts of the years 1933 to 1945 divided into successive 4-year groups. On the basis of these values the dynamic mean (average) of the total number of graduates of secondary schools was first determined for the individual years up to 1985 by means of the method of least squares. A first-degree trend was assumed on the basis of a graph and a continued proportion calculation. An examination of the results carried out by means of a computer showed a projected 17 per cent of the relevant age group receiving secondary school diplomas in 1975-76. The confidence range extends from 16.08 per cent to 17.98 per cent. Assuming a steady development corresponding to that of the last 12 years this means that, with a probability of 95 per cent, 16-18 per cent of the relevant age group will graduate from a secondary school by the late seventies. Austria would thus not have reached the minimum of 20 per cent, which is the goal in Western Europe.

Whether such an expansion would be possible from the point of view of personnel and school space has not been taken into consideration here. Only the optimum development of secondary education was to be shown in the 2nd Assessment. The correlation between the previous and the presumed future development is 0.949 (product-moment correlation).

For 1975-76 the trends excluded with a view to the above-mentioned method would have yielded the following results:

- 19.5 % (with a confidence range of 17.4 per cent - 21.9 per cent) r = 0.945
- 21.9 % (with a confidence range of 19.6 per cent - 24.4 per cent) r = 0.949

The presumed percentage of secondary school graduates could be worked out in the manner described above for every age group. It was assumed that

- 25 % of the secondary school graduates are below 18;
- 50 % are below 19; and
- 25 % are over 19.

On this basis the percentage of the various age groups receiving secondary school diplomas, calculated according to the method of least squares, could be converted into numbers of secondary school graduates per year.

The retention rates are known from the records. Table A above shows the retention rate for each type of secondary school. In order to arrive at total enrolment figures, we calculated the enrolments of the various grades on the basis of the number of graduates per school year and the retention rates. Where possible, the enrolment figures for the first grades were compared to the inflow figures available up to 1964/65.

Where discrepancies were observed the calculated figures were adjusted to the actual enrolments of the respective secondary school grades. The figures for the empirically ascertained retention rates and the actual sizes of the first-year enrolments - for the period for which they were available - were used in the assessment of the probable numbers of secondary school graduates. This means that the output figures for the next five to eight years as forecast in the Second Assessment are fairly accurate. (It is assumed that there will not be any notable changes in the retention rates). This method was first used for secondary schools in general and it was then applied to each type of school individually. In this process the projects of the school administration have been taken into account throughout.(1)

This method described above was supplemented by calculations in which the sizes of existing classes were considered.

The projection of overall output of secondary schools which, as noted above, was determined with the aid of a computer, corresponds on the whole to the sum of graduates from the various types of secondary school.

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(1) Particular attention is called here to the expansion projects of Department V/5 of the Federal Ministry of Education (Ministerialrat Dr. Lang) with respect to the grammar schools mainly for future teachers (see "Education and Teaching", volume V/1965).

In the same manner, output figures have been worked out for all types of schools with the exception of compulsory schools.

For the compulsory vocational schools the figures of the First Assessment were used. The figures for the general compulsory schools were obtained by the subtraction of those pupils who attend the lower divisions of general secondary schools, or other secondary schools, from the overall number of pupils of compulsory school age. The method used in assessing enrolment in the polytechnic courses will be shown in greater detail in Table 7b (Second Assessment).

This is only a brief explanation of the method used for the Second Assessment. A more detailed description of the variety of analyses carried out in the past, of the calculations made, and of the checking procedures used, would take us beyond the scope of the present study. It should be added that in carrying out this assessment we have evaluated the experience gathered by a great number of experts in the field of education.

B. Description of the Main Trends Revealed by the Projections(1)

1. Relevant demographic developments

Table 1 and the accompanying Graph I give the basic demographic data relevant to future school enrolments. The most pertinent fact that emerges - with respect to enrolments at the primary and secondary levels in the next decade - is the steady rise in the number of live births between 1953 (about 100,000) and 1963 (some 135,000). In order to provide a demographic picture in greater depth, the following facts have been taken from a detailed account of the factors on which the calculations of Austrian population developments are based (report BO 669/65):

- The number of live births expected between 1964 and 1970 was calculated on the basis of the present fertility indices (= number of live births per 1,000 women in a given age group). The fertility indices rose until 1961; since then a slight decline has been observed. In spite of the fact that the number of women reaching child-bearing age is comparatively high, the number of live births is expected to decrease somewhat. The pertinent data for 1964 and 1965 have, furthermore, underlined this trend.
- A comparison of the censuses of 1951 and 1961 has revealed a decrease in the 20-to 30-year-old age group, the group most productive of live births. This reflects the sharp decline in the number of births during the 1930's, which generally recovered during the 1940's.
- Infant mortality dropped from 6.9 per cent in 1949 to 3.4 per cent in 1961, and will probably continue to decrease; a similar development is suggested by figures in other countries.

  The following infant mortality rates have been projected for Austria:

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(1) The tables referred to in this section are found in the Annex to this chapter at the end of the book. To facilitate reference and comparison the tables of the First and Second Assessments which deal with the same subject matter are numbered identically (3 through 26); they are placed next to each other, in numerical order.

1962	3.3 %
1963	3.2 %
1964	3.0 %
1965	2.9 %
1966	2.9 %
1967	2.8 %
1968	2.8 %
1969	2.7 %

- Quite recently the mortality rate between the second and seventh years of age has shown a slight downward trend; for the next ten years a further decrease from 0.7 per cent to 0.6 per cent is expected.
- The mortality of persons from 6 to 29 years of age has not recently shown any notable changes and is not expected to change substantially within the next ten years.

The size of school entry age cohorts, 1967-1975

The sizes of the cohorts reaching compulsory school age during the next 10 years are expected to be as follows:

	Children reaching compulsory school age
1966 (1st January)	120,000
1967	124,400
1968	127,500
1969	129,100
1970	129,200
1971	128,500
1972	127,700
1973	126,800
1974	125,900
1975	125,600

These figures show that the number of children reaching compulsory school age will rise until 1970 and will decline only moderately thereafter; the next 10 years will, therefore, provide a substantial demographic base for continuing enrolment increases.

Table 2 follows each age cohort within the 5 to 29-year old range from 1950 to 1965 and projected to 1975. This table is a basic reference for calculating the size of age cohorts relevant to each school level.

2. Development of total enrolments (Tables 3a to 4b)

The overall enrolment figures at Austrian schools and institutions of higher education broken down by types of school (and fields of study) are of decisive importance for the determination of the expected demand for school space, teachers and funds. This demand will be evaluated in Chapter V: here we shall limit ourselves to a discussion of the expected expansion in enrolments.

In the general compulsory schools, an enrolment increase of about 30 per cent is expected over the next ten years: this increase may be attributed to demographic factors (increase in the size of the various age groups) as well as to the extension of compulsory schooling (effective after 1966/67). The Second Assessment, which takes into consideration the growing outflow of pupils from compulsory school to general secondary schools, anticipates a slightly smaller increase in enrolment in general compulsory schools - 29 per cent.

In the compulsory vocational schools enrolment will decline slightly from index 100 in 1965/66 to 99 in 1970/71, and will then rise to 118 in 1975/76. This development is caused by the decreasing size of the age groups concerned as well as by the introduction of the polytechnic course in 1966/67.

Enrolment in the intermediate vocational schools is expected to rise more sharply in the next ten years (by 34 per cent according to the First Assessment). As these schools may be attended after the completion of the eighth primary grade, the projected enrolments are not affected by the introduction of the polytechnic course.

The Second Assessment arrives at a much more pronounced increase from 100 (1965) to 164 (1975) for intermediate vocational schools. It takes into account not only the demographic development but also the increasing inflow in the past 12 years to such intermediate establishments as the commercial schools, the intermediate vocational schools for women's domestic and catering occupations and the vocational schools for social workers.

Experience analysed so far seems to indicate an increasing demand by parents and students for an education at intermediate vocational school level (3 to 4 years) plus subsequent training for master craftsmen and skilled workers (4 to 5 years altogether).

A marked increase in enrolment is also predicted for the intermediate schools for the training of teachers and educational assistants. Both assessments arrive at similarly high results (1975/76 index : 143 and 146 respectively, compared with 100 for 1965/66).

In the general secondary schools, the increase in enrolment is expected to amount, at a minimum, to about 50 per cent in the next ten years (First Assessment). Here too (as in the case of the compulsory schools) this development may be attributed to the increase in the size of age groups and the extension of schooling (both compulsory and general secondary) from 8 to 9 years.

The increase in enrolment predicted is even more pronounced - i.e. 68 per cent from 1965 to 1975 (Second Assessment) if the clear trend since 1946 towards a broadening of the stream leading to higher education is taken into consideration. Moreover, the Second Assessment also pays attention to the concrete projects of the school authorities.

Similar factors account for the sharp rise in enrolment in the secondary vocational schools - the increase in the size of birth cohorts, the one-year extension of schooling at the business academies and secondary schools for women's domestic and catering occupations.

The marked difference between the First and the Second Assessments (the Second Assessment predicts an increase in enrolment by 103 per cent between 1965/66 and 1975/76 as compared to 46 per cent in the First Assessment) is due to the fact that the available material was studied more thoroughly for the Second Assessment and that all trends observed were evaluated with great precision. The provisions of the School Organisation Act pertaining to the extension of the school types under consideration have also been taken into account.

In both assessments, concrete projects of the Federal Ministry of Education account for the increase in enrolment at the recently introduced teacher training colleges and schools for vocational school teachers.(1)

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(1) See notes prefatory to Tables 13-24b in the Annex regarding the phasing out of the old type of teacher training school, and see Chapter I, Section A4, for a more comprehensive explanation of the reforms in teacher training.

Since in the period under consideration the institutions of higher education are not affected by the demographic wave, total enrolment will only rise slightly.

3. Development of total output (Tables 5a to 12c)

The prospective enrolment figures, discussed in the previous section, are indispensable for the determination of the demand for school space, teachers and funds (see Chapter V), and are thus particularly relevant to the tasks of school administration and financial planning. Estimates of output, on the other hand, allow for a comparison of the expected "production" of the school system (graduates of the various types of school) with the demand of the economy for qualified personnel according to type and level of education. In Chapter VI of this study conclusions will be drawn from the comparison of the demand of the economy for qualified personnel as estimated by Dr. Josef Steindl (Chapter III) with the projected supply.

The output figures are important in one other respect as well: they furnish information on the efficiency of the school system; for example, they permit conclusions as to attrition and - insofar as they are expressed as percentages of the relevant age groups - they allow for comparisons with the efficiency of the school systems of other countries (see Section 5 below). A number of such comparisons will be made in Chapter VI. (In this connection, mention should be made of a publication of the Council of Europe, "Education in Europe - School Systems, a Guide", Strasbourg, 1965).

An overall view of the development of past and projected future output of the various school types is given in Table 28 below. Index numbers indicate the development according to both the First and Second Assessments and in terms of both base year 1950/51 and base year 1965/66. Output in terms of absolute numbers of graduates will be found in Tables 5a-12c.

This table shows that the output of the general compulsory school will be 22 per cent to 30 per cent higher in 1975/76 than in 1965/66. At the same time the number of journeymen - those who complete the vocational school courses obligatory during apprenticeship - will have risen by 8 per cent.

The output of the intermediate vocational schools is expected to rise by 17 to 59 per cent by 1975/76. The First Assessment is based on the assumption that it will be impossible to cover the increased demand for intermediate vocational school graduates; i.e., that the school construction programme will be limited. The Second Assessment, on the other hand, anticipates a special promotion of the intermediate vocational schools through, e.g. the granting of public status to various private schools, and the promotion of school construction programmes by the Federation and the other government bodies (provinces, municipalities), in order to meet the increasing demand for graduates of these schools.

In the decade under consideration, the output of the intermediate schools for the training of teachers and educational assistants will grow by 5 to 26 per cent. In the Second Assessment an increased inflow to the schools for kindergarten teachers is predicted as a consequence of the great demand for kindergarten personnel.

In 1975/76 the output of the general secondary schools is expected to be 52 to 70 per cent higher than in 1965/66.

It may be noted here, in anticipation of subsequent discussions in this report, that the increase in output expected for general secondary schools will probably fall far short of the demands of the economy even if a generous school construction programme should be financed and carried out. (See Chapter III regarding highly qualified manpower requirements and Chapter V concerning school construction needs to accommodate the expansion presently projected.)

Table 28

Output of the various school types (including institutions of higher education)

Comparison of the indices obtained in the First and Second Assessments

	1		2		3		4		5		6		7		8		9	
	General compulsory schools		Compulsory vocational schools		Intermediate vocational schools		Intermediate schools for the training of teachers & educational assistants		General secondary schools		Secondary vocational schools		School for higher social occupations		Teacher training		Institutions of higher education	
	I	II	I	II	I	II	I	II	I	II	I	II	I	II	I	II	I	II
	Index 100 = 1950/51																	
1950/51	100		100		100		100		100		100		-		100		-	
1955/56	133		158		159		70		83		101		-		76		100	
1960/61	124		168		155		141		191		199		-		106		101	
1965/66	32	32	177	177	108	122	16	19	187	190	198	222	100	100	227	242	170	170
1970/71	127	118	160	160	130	146	166	179	66	76	167	248	167	200	210	224	193	200
1975/76	146	133	191	191	159	194	195	211	284	323	212	351	267	333	256	288	186	209
	Index 100 = 1965/66																	
1965/66	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
1970/71	113	108	90	90	95	120	89	107	35	40	84	111	167	200	93	93	113	117
1975/76	130	122	108	108	117	159	105	126	152	170	107	158	267	333	113	119	109	123

The difference between the projected increase in the output of the secondary vocational schools according to the First and Second Assessment respectively, is particularly striking - 7 per cent in the one case and 58 per cent in the other.

The Second Assessment is based on the assumption that the recently introduced types, and special types, of secondary vocational school (especially for employed persons) will be expanded in accordance with the provisions of the 1962 School Organisation Act. Here again, it must be said that the expected output will be insufficient to cover the needs of the economy - particularly as even now there is a shortage of secondary school engineers and business academy graduates (caused partly by better offers from abroad and emigration).

Since the output of the schools for higher social occupations in absolute numbers is very small, the corresponding index values are of little significance.

With regard to the teacher training institutions, the age group due to graduate in 1970/71 is rather small - so that total output is expected to decline by 7 per cent in relation to that of 1965/66, while the 1975/76 figure will probably be 13 to 19 per cent higher than the 1965/66 total. Chapter V will discuss the problem of the demand for, and the supply of, teachers in greater detail.

The output of the institutions of higher education is expected to go up in the ten years under consideration by 9 per cent according to the First Assessment, and by 23 per cent according to the Second. These are only rough estimates, as all the relevant information - including the effects of the reorganisation of higher education - is not yet available.

4. Development of participation ratios (Tables 13-24b)

As noted in Section 1 above, the projected rise in enrolments will partly result from demographic factors, but also, to a considerable extent, from an increase in participation ratios. The evolution of age-group participation in the various types, and at the various levels, of education, is shown in Tables 13-24b.

The table numbers, with the corresponding school years which they cover, are as follows:

- 12 and 13 for the year 1950/51
- 14 and 15 for the year 1955/56
- 16 and 17 for the year 1960/61
- 18 and 19 for the year 1965/66
- 20 and 21 for the year 1970/71
- 22 and 23 for the year 1975/76

Three examples will serve to illustrate how these tables may be used.

Example 1

The total enrolment of 17-year-olds in schools of all types rises from:

- 18,293 (= 20.3 per cent of all 17-year-olds, i.e. 90,100) in 1950/51 to
- 23,129 (= 26.68 per cent of all 17-year-olds, i.e. 86,700) in 1955/56 to
- 35,817 (= 33.35 per cent of all 17-year-olds, i.e. 107,400) in 1960/61 to
- 38,489 (= 35.8 per cent of all 17-year-olds, i.e. 107,500) in 1965/66 (First Assessment)

Although in 1955/56 the population of 17-year-olds was smaller than in 1950/51, the educational participation of 17-year-olds was higher in 1955/56 than in 1950/51. The schools have undergone a "true" expansion both the absolute and relative numbers of 17-year-old pupils having increased.

A comparison of absolute enrolment figures is thus not sufficient; only by looking at the percentage of the respective age group can we say whether there has been an increase or a decline in enrolment, since these percentages are independent of the numerical size of the respective age groups.

Example 2

In 1955/56 there were 43,485 15-year-old pupils at compulsory vocational schools, while five years later there were only 31,400. A numerical decline can be observed here. However, a comparison of the number of 15-year-old vocational school pupils with the sizes of the total age groups reveals that while in 1955/56 32.38 per cent of all 15-year-olds attended a vocational school, by 1960/61, 35.28 per cent were attending such schools.

Here a decline in the absolute number of pupils - the consequence of a smaller age group - is observed in contrast to an increase in the participation ratio.

Example 3

The trends which become evident from the development of the cohort participation ratios are of fundamental importance for estimating future enrolment figures.

If we continue the series of percentages given in Example 1 (pupils 17 years old as a proportion of the total 17-year-old population)

- 20.3 per cent in 1950/51
- 26.68 per cent in 1955/56
- 33.35 per cent in 1960/61
- 35.80 per cent in 1965/66
- 52.92 - 56.40 per cent in 1970/71(1)
- 54.43 - 60.34 per cent in 1975/76

we see that in the past the rate of growth began to slacken somewhat but between 1965/66 and 1970/71 is expected to rise sharply. This sudden increase will be the result of various provisions of the 1962 School Organisation Act (9 years of compulsory schooling, extension of vocational education from 3 to 4 years, etc.). The decreasing rate of growth between 1970/71 and 1975/76 represents a resumption of the development observed in the past.

5. Development of output ratios by age group (Tables 25a-26c)

The output cohort, expressed as the percentage of pupils in a given age group who successfully complete a given type of schooling is of fundamental importance in making comparisons with other countries. On the basis of the Second Assessment, the following ratios were obtained for the secondary schools:

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(1) First and Second Assessments, respectively, for the last two years in the series.

Table 29

Percentage of graduates in total relevant age group for the birth cohorts, 1949-52 and 1953-56

	1949-1952 %	1953-1956 %
General secondary schools (excluding grammar schools mainly for future teachers)	8.3	8.6
Grammar schools mainly for future teachers	2.2	2.5
Secondary technical and trade schools	2.2	2.9
Business academies	1.4	1.9
Secondary schools for women's domestic and catering occupations	0.4	0.4
Total	14.5	16.3

The secondary schools for employed persons are not included here because the graduates belong to many different age groups.

If these schools are also taken into account, the overall percentages rise to

- 15.2 per cent for the birth cohorts 1949/1952; and
- 17.1 per cent for the birth cohorts 1953/1956.

In table 25a the pupils who have completed compulsory schooling - at present 8 years, after the autumn of 1966, 9 years - are grouped by types of school and level of education completed. Not all pupils reach the eighth grade in eight years of compulsory schooling.

Each group comprises 4 annual birth cohorts; in this way possible yearly variations may be excluded and the respective trends are more clearly visible.

Of the children of compulsory school age in the birth cohorts 1937-1940:

- 17.6 per cent completed the 8th grade of primary school
- 33.8 per cent completed the fourth year of upper primary school(1)
- 0.2 per cent completed the 8th grade of special school
- 8.1 per cent completed the fourth grade of general secondary school(1)

Total:59.7 per cent

This means that about 60 per cent of the birth cohorts 1937-1940 concluded their compulsory schooling in an 8th grade; the remaining 40 per cent did not attain this educational level. However, as may be seen from column 9 of the table, this ratio (60:40) has clearly changed since: of the birth cohorts 1949-1952 an average of 75.7 per cent completed the 8th school grade.

The introduction of a ninth year of compulsory schooling will enable a still greater number of pupils to complete the 8th school grade and to acquire the right to continue their education. On the assumption that the retention rate will continue to grow, the estimated percentage of pupils who will acquire the right to education beyond the primary level in the birth cohort groups 1953-1956 and 1957-1960 is 87.5 per cent and 88.1 per cent respectively.

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(1) The fourth year of the upper primary and of the general secondary school is equivalent, in terms of years of schooling, to the eighth grade of primary school.

Column 7 of Table 25a shows that in the past 12 years the percentage of pupils of compulsory school age who completed the fourth year of general secondary school had increased from 8.1 per cent to 11.5 per cent. A continued rise is expected up to 1975; according to the First Assessment, the number of pupils who complete the fourth year of general secondary school will amount to 13 per cent of the relevant age group, and according to the Second Assessment, to 17 per cent. Table 25c, closely related to 25a, shows the percentage of the birth cohorts completing the eighth grade who are expected to attend the new polytechnic course provided for the ninth compulsory year of schooling. Practically no students completing the fourth year of general secondary school (equivalent to the eighth grade) are expected to enter this course (column 5), but more than a third of the total age cohort is expected here.

Table 25e deals with another segment of the output of the 14-year-old cohort from the schools: the number of graduates from compulsory vocational schools (apprentices who have passed the journeymen's examination) and from intermediate vocational and teacher training schools is shown as a percentage of the relevant age groups. Of the 14-year-olds in the birth cohorts 1937-1944, an average of 32.7 per cent per year passed the journeymen's examination; an increase of about 6 per cent is expected during the next ten years.

Table 26a gives the percentages of 18-year-olds having passed a secondary school leaving examination, or projected to do so for the birth cohorts 1933-1956 taken together in sets of four years.

It will be seen from column 7 that the output ratio rose from an average of 6.6 per cent of 18-year-olds for the birth cohorts 1933-1936 to an average of 11.1 per cent for the birth cohorts 1945-1948. For the mid-seventies (birth cohorts 1953-1956) the First Assessment predicts a rise to 12.8 per cent whereas the Second Assessment arrives at a projection of 17.1 per cent of all 18-year-olds receiving secondary school diplomas.

Columns 2 and 4 show an expansion of schools for training of teachers and of secondary technical and trade schools (compare Table 10a and 10b, First and Second Assessments).

It may be noted that while Table 25a shows 76 per cent of the 1949-1952 birth cohort completing eight years of school, Table 26a projects only 12.5 per cent of this same cohort subsequently expected to complete the secondary school leaving examination.

Eighty-seven-and-a-half per cent of the next birth cohort, 1953-1956, is expected to complete eighth grade (or equivalent) (Table 25a). The rise in successful secondary school leavers, projected as 12.8 per cent in the First Assessment, represents no proportionate rise in secondary school output, while the 16.3 per cent figure of the Second Assessment does reflect this trend (Table 26b).

Table 26c (output of the third level of education) the percentage of university and college graduates (column 1) is seen to rise as compared to the size of the age groups.

In order to prevent overlapping (university and college graduates who received degrees in more than one field of study) only the so-called first degrees were counted here. The output ratio of university and college graduates increases from 2.4 per cent of the relevant age groups for the birth cohorts 1933-1936 to 4.1 per cent for the birth cohorts 1941-1944, and is expected to go up to 4.5 per cent for the groups born in 1953-1956.

The number of graduates of the teacher training colleges, the schools for vocational school teachers and the schools for higher social occupations - all of which were introduced by the 1962 School Organisation Act - was estimated on the basis of the projects planned by the Federal Ministry of Education.

6. Main characteristics of university student bodies (Tables 27-41)

These tables survey present and past university enrolment and output and present a profile of student bodies, including such characteristics as composition by sex, social origin and marital status, percentage of foreigners, main fields of study, required and actual length of studies, etc.

A brief note defining terms in these tables precedes the tables themselves.

The indices in Table 27 show that between 1953/54 and 1965/66 enrolment increased two and a half times, from 20,011 to 52,169. Since 1956/57 the percentage of female students has been increasing; the following are the index numbers for 1953/66 (1953/54 = 100):

- Total enrolment 261
- Male students . . . . 248 (calculated from the figures given in the tables)
- Female students 309

Moreover, this table shows that in 1961/62 the number of foreign students was three-and-a-half times higher (index 351) than in 1953/54 (100); since then the index value has dropped to 318.

To permit comparisons with the data supplied in Table 27, Table 28 gives the number of Austrian and foreign students as a percentage of total enrolment and of inflow respectively. The proportion of foreign students, who in 1958/59 represented 31 per cent of the total student body, dropped by 1964/65 to 20 per cent; in this connection it is assumed that foreign students who have started their studies in Austria will also complete them there, and that it is the inflow of foreign students which is decreasing. The same table shows that the proportion of female students has risen to 25 per cent of the student body, but has remained at that level for the last three years (1962/63-1964/65).

Table 29 divides all full-time students of Austrian nationality enrolled in the winter term 1964/65 into the following two groups:

- Students below the age of 25;
- Students above the age of 25.

A further differentiation according to sex would yield the following results:

	Male		Female	
	Below 25	Above 25	Below 25	Above 25
Absolute numbers	24,211	2,226	8,500	310
As a percentage of the population of the corresponding age group	5.4	1.4	2.0	0.2
As a percentage of total enrolment	91.5	8.5	96.5	3.5

Thus, 5.4 per cent of all males in the age groups 18-25 are enrolled at institutions of higher education as compared to 2 per cent of all females in the same age groups. Ninety-one-and-a-half per cent of all male students and 96.5 per cent of all female students are below the age of 25.

It should be noted in this respect that a portion of the male students have already completed their military service before embarking upon studies at an institution of higher education.

Table 30 differentiates the overall numbers supplied in Table 29 (the total enrolment of Austrian nationals in the winter semester 1964/65) according to main field of study and gives the age structure of the full-time students in each of these fields (in absolute numbers and as a percentage of total enrolment of full-time Austrian students). Thus, e.g. 94 per cent of all medical students, and 77 per cent of all students of theology are under 25 years of age.

Table 31 offers an explanation for these differences by showing the age structure of freshmen in different fields. Among the freshmen at medical school the share of students below the age of 21 is highest, amounting to 93 per cent. This means that students decide comparatively early after the secondary school leaving examination to enter this field of study. The percentage of students below the age of 21 is lowest at the arts colleges (see descriptive note preceding Table 27 (67 per cent), the school of theology (71 per cent) and the school of business and commerce (77 per cent). The proportion of students who decide relatively late to embark upon these studies, or who undertake them after first having studied something else, is comparatively high.

Table 32 divides all Austrian university students according to main fields of study and according to the regularly enrolled term in which they were registered at the time of the survey. It shows the percentages of students in their first to tenth, eleventh to twentieth, twenty-first and more terms for which credit is given. It thus indicates the length of time spent at the university in different fields. The following percentages, for example, show the proportions of students who were in their eleventh to twentieth semesters:

- 28 % of the students at schools of technology;
- 22 % at schools of mining engineering;
- 16 % at faculties of liberal arts (including science);
- 12 % at agricultural colleges;
- 11 % at medical schools;
- 9 % at arts colleges;
- 8 % at faculties of theology;
- 8 % at faculties of law and political science;
- 3 % at schools of business and commerce;
- 2 % at schools of veterinary medicine.

The comparatively high percentage of students in the 11-20 semester group at schools of technology provides an indication of the length of studies in this important field.

Table 33 throws light on the same question from a somewhat different angle - by confronting the required with the average actual number of semesters taken to graduate. In almost all fields, the actual number exceeds the required number. In most cases the additional time required is between 12 and 25 per cent (8-semester courses completed in an actual 9 to 10 semesters). But in quite significant areas such as the physical sciences and engineering the actual time spent is 33 to 100 per cent of the formal requirements.

In Table 34 the full-time students of Austrian nationality in 1964/65 are divided into two groups: those who had changed to another institution of learning or another field of study and those who went to study abroad. It can be seen that 2 per cent of the Austrian students went abroad and that 11 per cent had effected a change of field or institution within Austria; of these 4 per cent changed their field of study and 7 per cent transferred to another institution of higher education.

Table 35 shows the percentage of Austrian students who pursue their studies with or without study grants or scholarships. These groups are differentiated according to marital status; moreover, a distinction is made between students who have their permanent residences in the locality in which they are studying and those who have not.

Of the 38,714 full-time students of Austrian nationality (28,824 male, 9,890 female students) in the winter semester 1964/65, 23.3 per cent or 9,020 (6,955 male and 2,065 female students) received study grants or scholarships. Of these, 39 per cent were residents of the locality in which they studied and 61 per cent had their permanent residence elsewhere.

Fifty-three per cent of the students who do not receive study allowances or scholarships have their permanent residence at the place of study, 47 per cent have their residence elsewhere.

Table 36 divides the full-time Austrian students in the same semester according to their fathers' occupations and according to main fields of study.

- 6 % of the students listed "worker" as their fathers' occupation;
- 10 %, retired worker or retired employee;
- 30 %, self-employed;
- 52 %, "employee" (including civil servants and privately employed persons at all levels of responsibility).

Table 37 shows the development of the output of Austrian institutions of higher education from 1953/54 to 1963/64 by type of degree.

Among the Austrian nationals, the percentage increase in output is highest for the translators' examinations which more than doubled. Next in line are the examinations qualifying graduates to teach at secondary schools (index 159), the third state examination qualifying law and political science graduates for employment in the State administration (index 141), the diplomas of the schools of technology and schools of business and commerce (index 127), and the diplomas and/or leaving certificates of the arts colleges and academies (index 102). It is only the index of doctorates which has dropped (index 95). Students have thus shown a tendency to content themselves with a diploma, the third state examination or the examination for secondary school teachers (i.e. not to go on to obtain a doctorate) if they plan to enter occupations not requiring a higher degree.

Table 38 breaks down doctorates and diplomas granted in the academic year 1963/64 by main field of study.

Of 100 doctors:
- 41 graduated in law or political science
- 25 in liberal arts (including science)
- 19 in medicine
- 6 in technology
- 5 in economics
- 2 in veterinary medicine
- 1 in theology
- 1 in mining

Of 100 students who received diplomas:
- 56 graduated in technology
- 36 in business and commerce
- 4 in interpreting
- 3 in economics
- 1 in veterinary medicine

Table 39 deals with the qualifying examinations for secondary school teachers in 1963/64. Seven-hundred-and-twenty-eight registered candidates from the previous year were joined by 524 new candidates. Of these 1,252 candidates, 581 took the examination, 357 passed and 224 failed.

Thus, only 357 of the 1,252 candidates passed the examination and 57 decided to drop out, leaving 838 candidates over for the next year.

Table 40 shows the age structure of male and female Austrian recipients of a doctor's degree or a diploma. It is striking that 21 per cent of the males, but only 9 per cent of the females, were older than 30 when they received their doctorate. The situation is similar in the case of diplomas.

Table 41 divides Austrian university graduates in 1963/64 according to age, main field of study and type of degree.

The following percentages graduated below the age of 25:

- 82 % of the law and political science students who passed the 3rd state examination;
- 74 % of those who received a doctor's degree in law and political science;
- 76 % of the graduates of the school of business and commerce (diploma);
- 60 % of those who passed the qualifying examination for secondary school teachers;
- 60 % of the graduates of the school of agriculture (diploma);
- 53 % of the graduates of the school of technology (diploma).

Chapter III(1)

SKILLED MANPOWER REQUIREMENTS IN A CHANGING ECONOMY
PROJECTIONS UP TO 1980

Introduction

It would be highly unrealistic to base a forecast of Austrian manpower needs on a simple extrapolation of past trends. The future viability of the Austrian economy, which is now passing through a transitional phase, will require major shifts in the structure of output, in the methods of production, in the importance given to research, development and planning, and hence in occupational patterns. Such changes are, moreover, implicit in stated or generally agreed policy objectives.

The necessary reorientation of the economy

Industrial output patterns must be altered if Austria is to maintain full employment and a 4 per cent annual growth of GNP per employed person, and to achieve its aim of closer integration with a European economy in which major efforts are being made to reduce protective barriers. The basic industries, which have heretofore been the main source of Austrian exports, are becoming decreasingly profitable and a shift is needed to such expanding sectors as engineering, chemicals, electrical goods and precision instruments. International competition in these sectors is competition in know-how, research and skill. A minimum amount and range of research activity must be maintained if Austria is to be able to identify and take advantage of the appropriate technological possibilities.

This obviously implies the need for large stocks of highly qualified personnel. Such personnel is also required to stimulate a reorientation of Austrian industry as a whole from a concentration on routine tasks to more forward-looking activities such as research and planning. And, finally, skilled manpower must be available to ensure the effective establishment and use of automated processes which are necessary both to achieve the requisite rate of productivity growth and to remedy the present severe shortage of unskilled labour.

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(1) This chapter is supplemented by a technical annex at the back of the book which gives details on the basis of the calculations and more detailed statistical tables and graphs.

But despite these needs, the number of professional and technical personnel employed in the Austrian economy has stagnated in recent years, rising only from 5.8 per cent of the total labour force in 1951 to 6.7 per cent in 1961 and, as a proportion of non-agricultural labour, remaining stationary at 8.6 per cent during the same period. Industry has generally "diluted" its available stocks of highly qualified personnel, deferring all research and planning that have not been indispensable to the pursuit of immediate production aims and importing skills from abroad. Any mechanical extrapolation of recent trends in the employment of educated manpower would present a highly abnormal picture of Austrian economic development in the future, sharply at variance both with the experience of other industrial countries and with Austria's own needs.

Projection of future output and occupational structures

In the light of the above, manpower requirements up to 1980 have been estimated on the basis of the necessary changes in the structure of output and in the occupational structures necessary to produce it. The manner in which these projections were arrived at will be explained in detail in the body of this chapter and in the appendices thereto and only rather briefly described here.

The distribution of total manpower over the broad sectors of the economy has been estimated by projecting into the future the changes which have taken place between 1951 and 1961 - the rate of such change being considered dependent, not on time, but on the rate of growth of GNP per capita. The total output produced by this manpower is assumed to increase at an average rate of 4 per cent per year per employed person for the economy as a whole.

The distribution of output as between the different manufacturing industries has been projected in a special calculation based on international experience: it has been assumed that it will evolve in the same way that the structure of manufacturing output has developed in the OECD countries as a whole over the past six decades. This would mean a greatly increased share for the engineering and chemical industries - essential to ensure the future of Austrian exports.

In forecasting the occupational structure necessary to produce this output, an uncritical extrapolation of past Austrian trends would fail to reflect real needs - as can be seen from the stagnation noted above - in the employment of professional and technical personnel. It was found, in fact, that between 1951 and 1961 the Austrian occupational structure evolved in such a way as to bring it closer in line with that of the United States with the one very important exception of precisely that category of personnel. While in Austria the proportion of professional and technical workers as a share of non-agricultural manpower remained stationary, it increased in the United States at the rate of 2 per cent per year.

Hence, to obtain an initial, global view of the future occupational structure, first the changes observed during 1951-1961 have been projected to 1980 (again, the rate at which they take place being dependent upon growth in GNP per capita, not on time). Then, the development of the category of professional and technical workers has been corrected to make it grow - as in the United States - by 2 per cent a year as a proportion of non-agricultural manpower. And, finally, the share of the other occupational groups has been decreased proportionally in order to make room for the increase in this group.

Projected manpower needs and deficits

University graduates

Within the framework of the overall structural guideline derived as described above, detailed estimates have been made of the actual numbers needed for each major occupation in the light of the relevant factors pertaining to the various sectors of the economy, including structural changes. In the case of engineers, for example, the calculations are based, depending on the industry or sector involved, on a number of assumptions as to, e.g. the relationship between growth in output and numbers of engineers required, the increase in the ratio of engineers to total employment as technological development proceeds, etc. Insofar as possible, the incidence on the demand for engineers of activities which are concerned with or arise from changes in type or techniques of production is also taken into account; this would involve the demand for, e.g., research engineers and engineers applying new methods or giving detailed technical advice to customers on the use of new products.

Similarly, total expansion requirements have been calculated for all other categories of university-educated manpower for the period 1961-1980. The engineers represent the largest single item - 16,500 - of overall graduate manpower expansion needs, which come to a total of 53,500. It should be noted that the latter figure closely approximates the figure of 55,000 obtained for graduate manpower requirements on the basis of the initial global evaluation of occupational structure described in Section B above.

Confronting the demand figure with the supply estimates in the 1st Assessment of Chapter II (the estimates of the Austrian Statistical Office), substantial deficits - taking into account wastage including an allowance for emigration - appear. The estimated deficits are:

For the period 1961-1964	2,398
For the period 1965-1969	7,390
For the period 1970-1974	9,591
For the period 1975-1979	12,544

Secondary school graduates

From the estimated requirement for university graduates, the need for that portion of secondary school leavers who will go on to higher education has been derived. It has been assumed - as an approximation adequate for purposes of this projection - that all general secondary school graduates will go on to the universities and that all teacher training college students will be recruited from the grammar school mainly for future teachers. It has been further postulated that 20 per cent of the graduates of the secondary vocational schools will enter higher education. The average time lapse between secondary school and university graduation has been determined as six years, and the average attrition rate in the universities as 50 per cent - although variations in the attrition rate for graduates of different types of secondary schools are taken into account.

In order to round off the estimate of secondary school output requirement, it has been necessary to add to the total of secondary vocational school graduates who are likely to go on to higher education the numbers needed for direct entry to the labour market.

The overall results of the projection of required secondary school graduates (see Table 40 of this chapter for breakdown by school type) are as follows:

For the period 1965-1969 . . . . 19,119 as an annual average
For the period 1970-1974 . . . . 21,435 as an annual average
For the period 1975-1979 . . . . 30,048 as an annual average

The deficits incurred when these demand figures are confronted with the two school output assessments of Chapter II are shown in Table 91 of Chapter VI. On the basis of the 1st output assessments the overall annual deficits for the first two time-periods concerned would be:

1964/65-1969/70 . . . . 7,605 annual average
1969/70-1970/74 . . . . 10,399 annual average(1)

Of the 21,400 secondary school leavers per annum who will be required in the period 1970-1974, some 13,000 will have to come from the general secondary schools, and these will represent the bulk of the university entrants. Since the rate of transfer from the upper primary to the general secondary schools is negligible, the main stock of general secondary school leavers in the early '70's is already in the lower forms of secondary school and its size is therefore pre-judged. Moreover, attrition in the general secondary schools is (as in the universities) about 50 per cent.(2)

Hence the difficulty of adjusting the educational system rapidly to the need for expansion. In order to remedy the shortage of university graduates in the 1970's - which will be the most difficult period - an emergency programme is needed at both secondary and university levels. For example, it will be necessary to take special measures (including efforts to change parental attitudes) to shift much larger numbers of able youngsters at the age of 14 to the grammar school type of education, to step up secondary school building capacity, to reform secondary school teaching methods so as to reduce attrition, and to introduce reforms in method and curricula in universities in order both to cut down attrition and length of studies. The need for such measures underlines the qualitative aspect involved in any effort to raise the output of highly qualified personnel.

Skilled workers

The calculation here rests on rather uncertain ground. This is because of the changing nature of the various occupations during a transitional phase in the technology of production as well as the difficulty of ascertaining the present stocks of those who should be considered as "skilled workers". The methods used in projecting skilled worker needs will be explained in detail in the body of the chapter, but it may be well to indicate here some of the basic considerations underlying these estimates.

Neither the mechanisation of the past 15 years which eliminated the skilled worker on the production line in mass-producing industries, nor the process of automation which is creating new types of skilled workers has run its course. The dominant position in future will be held by the repair and maintenance workers, many of whom are required to have increasingly advanced technical knowledge and a very high order of skill, while still other types of highly skilled categories are continually being created.

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(1) The increase in the deficit for the 1969/70-1970/74 period is largely caused by the addition of a 9th compulsory school year which will create a one-year gap in the cohorts entering the labour market.

(2) See Chapter II, Section A1, for estimate of retention rates in various types of secondary school.

Apprenticeship in a trade is no longer adequate for many types of workers, some of whom should be trained in industry-run training centres; for many other occupational types, only the intermediate technical school can provide the breadth of knowledge and the occupational flexibility required. It will, in fact, be necessary to triple the output of these schools - from the present annual figure of 2,400 to about 7,500 a year in the period 1975-79, projected as follows:

1965-69	3,400
1970-74	4,400
1975-79	7,500

The demand for traditionally-trained apprentices (those completing compulsory part time trade schools) will continue a moderate rise, as shown in the following figures:

	1965-69	1970-74	1975-79
Annual requirements	28,600	32,600	34,500
Annual output	25,092	29,710	34,500 (1)

Altogether the general implication is that the great difficulty to be encountered in obtaining the number of recruits to the ranks of skilled labour points to the need for emergency measures, especially the training and retraining of adults.

This chapter will show, as we have seen from the foregoing summary, the gap that exists between the needs of the economy and the expected output of the educational system. Even that output projection which takes social demand trends into account falls far short as our concluding chapter will stress - of the requirements of skilled and highly qualified manpower. But in the next chapter we shall examine the factors which could release a new flow of effective social demand that was not predictable on the basis of past trends.

A. Education and Economic Growth

Modern economics, inspired perhaps by the experience of the industrialisation of underdeveloped countries, has recognised the decisive role of training and education in economic development. What difference does an additional engineer (to take an example) make to the rate of growth? He may be able to introduce into a factory without delay a new process which otherwise would have to wait until another engineer, carrying through a process of innovation at another factory, was free. Or he may make it possible to build a new plant at once, where otherwise this might have to await the completion of another plant using an engineer with similar training. Or he may enable a firm to start a research project without waiting for the completion of another research project of a similar type using similar labour. Or he may put the firm in a position to make another offer in competition for a building project, such an offer increasing the customer's range of choice and therefore (up to a point) the chance of getting a technically more satisfactory solution.

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(1) 1975 and 1976 only.

All this means speeding up technical development and therefore increasing the rate of growth. The engineer may do something else which deserves more than a passing reference: he may improve the quality of safety of a product; this means he will make the growth more solid.

In all these examples, the engineer will become effective insofar as he is associated with an investment into which his labour enters. Without the investment, the engineer's labour would not be fully used and, similarly, without the engineer the investment could not be made to bear fruit. We can expect that in circumstances of comparative abundance of skilled manpower an increase in investment will be highly productive, but not an increase in skilled manpower. The situation of Austria in the 1930's offers a good illustration of this. In the opposite case of a scarcity of skill and a relative abundance of investment, an increase in skilled manpower will greatly augment the yield of investment, while an increase in investment will yield only very little.(1) It will be argued below that the position of Austria at present, as well as its expected position in the near future, corresponds to this case.

The task of assessing manpower requirements is to judge whether and how far the latter situation prevails, and approximately how much skill could be added without saturating the capacity for using it at the given investment rate. Clearly this calls for an appraisal of impending technological developments. At the present time, the industrial world, and with it Austria, is about to undergo a great technical upheaval - the introduction of automation - which has rightly been called a second industrial revolution. The practical administrator, and even the industrial manager, are apt to under-estimate the impact and consequences of such developments: the manpower forecasts have, not least, the function of correcting this excessive conservatism, which threatens to ignore the very changes which are most relevant to our decisions bearing on the next ten or fifteen years. In fact, what practical men do is to extrapolate the present practice and policy. Manpower forecasts such as those given in this chapter also extrapolate, but they extrapolate the rate of change and, moreover, they do not apply the extrapolation uncritically, but modify it on the basis of an analysis of the relevant economic problems.

But since one can anticipate future technological developments only very roughly, can manpower requirements serve as a solid basis for educational planning? In fact precision in the projection of requirements is not necessary. Let us take the case of teachers as an example. A standard has to be set for the number of pupils per class if we want to calculate the required number of teachers, but it is not easy to determine that a given ratio is the only correct one; it is much more appropriate to indicate a range within which the number of pupils should fall. The same is true for other kinds of manpower. The number of engineers required for the efficient functioning of an enterprise having a given production programme can only be indicated by reference to an upper and lower limit. The art of estimating manpower requirements consists of trying to strike an average, or rather below-average, value within this range which is at a safe distance from the critical saturation point for the type of skill in question.

The idea of a range is also appropriate to the balance, referred to above, between the flow of investments and the number of experts who prepare, plan and implement the investment programmes. We may postulate that for a given flow of investments there is a range of expert manpower staffing below which the investments yield a poor return for lack of expert preparation, and above which the experts cannot be fully utilised because the projects and ideas which they produce are more than can be embodied in the given flow of investments. Within this range, manpower requirements are elastic and the supply of manpower creates its own demand. The economy adjusts itself partly through the scarcity of common labour created by the deviation of youngsters into schools and training centres and apprenticeship; this scarcity forces the pace of automation and rationalisation, and this in turn increases the need for highly skilled manpower to prepare and carry out the technical changes. At the same time, given an enlightened leadership in public administration and industry, trained people will be absorbed as they come along, because they will set themselves new tasks which could not be thought of before, but which in many cases will greatly benefit the economy.

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(1) See M. Kalecki: "Some Theoretical Problems of Long-run Planning", in "The Review of the Polish Academies of Sciences", Vol.III, No.3-4.

These arguments are no longer valid once one goes beyond the range mentioned above and the critical point is reached at which addition of skill yields no improvement in return on investments. Skilled personnel are then used for tasks for which their training is not necessary, and this produces frustration and also, in most cases, lower salaries than expected.

In practice, the danger of saturation - at the present stage of development of our society - is very small as far as the total number of highly skilled personnel is concerned; but it is a real danger with respect to particular types of skill and training. If the wrong specialists are trained, and if the training does not correspond to the present requirements of the economy, we may find that we have created "plenty in the midst of scarcity." Manpower requirement estimates have the particularly important function of indicating, at least broadly, which types of skill and training are required.

But if manpower estimates were to have a strong influence on our decisions, would that not mean directing the stream of young people into various fields of education? Directing, yes, through the provision of schools, courses, and teachers which, together with a knowledge of the employment prospects in the various professions, would have the effect of attracting young people to the kinds of training which are in demand. Young people, especially the gifted among them, are attracted to good schools, to good teachers, and to interesting courses of study; there is a competition between schools, universities and faculties for the best students.

Should manpower requirements dominate educational policy? Certainly vocational training is not the only aim of education. It has other more fundamental functions: it provides continuity to society by transmitting the store of knowledge or "information" accumulated by previous generations. At first sight, this might be the same as vocational training: in a society of craftsmen each would pass on the knowledge of his trade to the next generation. But to provide continuity not only to a trade but to society as a whole, the stress must be on the common heritage. Education must not only transmit skills which are peculiar to various professions but it must also bequeath something more general in order to cement society and counteract the forces of disintegration which threaten to disrupt it. In a situation in which people are threatened by alienation from each other and from the products of their work by the diversity of their occupations, social positions, economic interests and backgrounds, education should enable them to continue to understand each other and at the same time to understand their own place and function in society. But if this is the great task of education - beyond mere vocational preparation - then it becomes immediately clear that the content of education must be shaped by society. This content cannot be permanent, cannot be formed by an abstract ideal; it must continuously evolve together with our scientific, technical and social development if education is to amalgamate people into a society which they do not reject but, rather, understand and actively support.(1)

The school system is not alone in providing education in the wider sense of the term, that is to say, in passing on from one generation to the other information and, therefore, "culture"; outside the school system there is, on the one hand, the family and, on the other, the commercial apparatus of newspapers, magazines, films, advertisements and so on. This commercial apparatus, in particular, is in competition with the school. The dangers of our commercial "culture" are obvious and do not need to be stressed: the school is very important as a counterweight, a countervailing power against commercialisation and the consumer society.

But, at the same time, it must also be realised that the school system is in competition with other institutions having perfectly valid aims: a great number of training systems are being provided by firms, chambers of commerce, trade unions, and so on, just as, on the level of higher education, private research institutes, which to some extent also fulfil educational functions, are competing with the universities. It cannot be denied that this competition is to some extent an indication of the inadequacies of the official state-controlled school or university system and that it is both healthy and inevitable: the school system will be judged by its success in this competition with other institutions, and the competition will be most critical at the most sensitive point - the competition for the most gifted youngsters.

The school system is wedged in between its rivals: on the one hand, the alternative vocational training facilities just mentioned; on the other hand, the carriers of commercial culture. The competition with the latter must appear most serious to all who care about whether the minds of the new generation will be shaped by the traditions of humane civilisation or by the ideals of the consumer society. It is important to realise that the outcome of this competition for the allegiance of the young minds will largely depend upon the performance, and the quality, of the school. The quality and performance of the school will, at the same time, also decide whether the output of the schools meets the economic necessities of our time. Manpower requirements are expressed in numbers, but we must from the outset avoid the misunderstanding that it is numbers only which matter. The demands of the economy on the school system cannot be fully expressed in terms of the quantity of various kinds of graduates required. In fact, it can safely be said that the school's and the university's adaptability, and their readiness to change in response to social and technological developments will decide whether manpower requirements are met in any but a mere formal sense. There is no doubt, however, that the very expansion of the educational system will contribute to creating a climate favourable to reform.

It was stated above that society shapes the content of education. Society also, however, dictates the manner in which the educational process is conducted and the objectives it serves. For a long time, higher education has been dominated by the idea of a "privilege of education", by the ideal of education for gentlemen, confined to a narrow caste. This ideal, still not entirely extinct in our time, is being superseded because of the insatiable needs of modern industrial society for highly trained people, and also because of the improvements in living standards, which will soon make leisure, for the first time in history, available to large masses of people. To use this leisure, people need education, and this has to be provided well in advance because the basic education has to be given at an early age and the working life of those now growing up extends beyond the present century.

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(1) This passage refers particularly to the content of education as it is relevant to preparing people to function in the economy, and is not necessarily incompatible with a content in education which also promotes the development of those humanistic values more necessary to society than ever before. Compare Hans Nowotny: "Planning in Education" in "Pädagogische Mitteilungen", 1963, Vol. 1, p.2.

The educational system, however, is one of the most conservative elements in society; to some extent it mirrors the conditions of the political and social system of the distant past. In Austrian schools and universities discussion and argument have only a comparatively small place, much too small a place. Rote learning is not extinct in our universities. The concept of a certain quantity of subject matter to be conveyed to the student plays a large role and leads to an extensive duration of studies and to competition between the representatives of various subjects for the time in school or university curricula. The opinions of the teacher count a great deal.

It can be said therefore that Austrian education relies on authority more than on argument and discussion, on factual knowledge more than on training in methods. Our great teachers have all been exceptions to this rule, but unfortunately a large number of our graduates have remained outside the reach of their influence. Most graduates trained in this climate are not very independent-minded, not questioning and critical, not ready to welcome technical progress, and therefore not very appreciative of research and development. The decisive role played by this attitude on the part of our leadership in the development of Austrian industry will be stressed below.(1)

The quality of education, and therefore the methods of education, are of the greatest importance to the economy. Modern technology and the rapid change which characterises it require, above all, independent thinking and questioning minds ready to discard prejudices in favour of unaccustomed ways of thought. Our educational system will compete in these respects not only with the training facilities of firms or private institutes, but it will also compete indirectly, through the agency of our economy, with the educational systems of other nations.

B. The Austrian Economy in Transition

1. Projected shifts in output and occupational patterns

Manpower requirements depend on what the economy is expected to perform: the estimates have to be based on a target set in the framework of a co-ordinated economic plan. We do not have a national plan, but there is nevertheless sufficient agreement about the basic desiderata to make the following assumptions appear valid as a basis for the estimates.

1. Continuing full employment. We assume that government spending policy will be sufficiently expansive and, if need be, counter-cyclical, to prevent serious lapses from full employment.

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(1) The issue raised here by Dr. Steindl is of a level of importance which requires that it should not be allowed to remain a simple matter of conflicting opinions among individuals, however well-informed. Rather this presents an issue which should be the subject of dispassionate scientific investigation which should be conducted with the participation of the educational authorities concerned.

2. A growth of Gross National Product per occupied person of 4 per cent per annum on the average from 1961 to 1980 (this has been the actual rate of increase from 1958 to 1963). We assume that policies appropriate to securing this growth rate will, in fact, be pursued by the Austrian government in view of the fact that the Austrian people have become accustomed to a similar annual increase in the standard of living. The target set is in fact very modest in view of the general desire to reduce the gap between Austrian real incomes and those of the more advanced industrial countries. The policies appropriate to continued growth will be outlined in the course of this chapter. Among them is the provision of skilled manpower to an extent which will be indicated by the estimates.

The two basic assumptions defined above make it seem logical to proceed as follows in assessing the future shape of the Austrian economy: we start from a forecast of population and derive from this, and from certain assumptions about activity rates, the total manpower available in 1970, 1975 and 1980 (see Appendix I in the Annex to this chapter at the back of the book). Total manpower will remain, very approximately, constant in the period of time considered (first declining a little up to 1970, and then increasing, finally, to a figure higher than the present level). The decisive change for economic development will not be in the size of total manpower but in its composition.

The distribution of manpower between major industrial sectors of the economy in 1980 results from a projection of the changes which took place between 1951 and 1961. These changes, however, are assumed to depend not on time but on the Gross National Product per capita; they will, as a consequence, take place more slowly from 1961 to 1980 than from 1951 to 1961, because the Gross National Product is assumed to grow more slowly in the later period than in the former.

In contrast to other methods commonly used, the present estimates are not derived from expected demand in various sectors, because it may be argued that the distribution of manpower between major sectors is not governed very closely by demand, but rather by autonomous factors. In agriculture, for example, the outflow of manpower is determined by social and economic factors which are, to a large extent, independent of the demand for agricultural products. People leave agriculture because they want to live in towns or because they want to work in manufacturing. They prefer a different way of life. The supply of manpower in agriculture, therefore, will be determined by these sociological factors; and a balance of the needs of the population for, and the supply of, agricultural products will be reached either by an increase in agricultural productivity or by an increase in imports. It is likely that the scarcity of labour in agriculture will enforce a considerable increase in productivity, especially through the abandonment of small uneconomic holdings and the consequent concentration of agriculture.

Another example of the autonomous role of supply is the tertiary sector. There is at present a great scarcity of service manpower in Austria. In many fields this will lead to the introduction of labour-saving devices, such as self-service in commerce, automation in offices, etc. In some cases service personnel cannot be replaced by machines and additional manpower will have to be attracted by increases in relative wages. For the tertiary sector as a whole, however, a balance of manpower supply and demand will only be achieved by rationalisation enforced by the scarcity of labour.

It is foreseen that manpower in agriculture will decline from 760,000 in 1961 to 336,000 in 1980. The manpower thus made available will flow into trade, the services and manufacturing; between 1961 and 1980 the share of trade will increase from 9 to 12 per cent, of services from 12 to 19 per cent, and of manufacturing from 20 to 25 per cent. The shift away from agriculture and, especially, the continued growth of manufacturing, are essential to the growth of productivity in the economy as a whole. The industrial structure foreseen for 1980 is not very unlike that of Switzerland in 1960: in both cases, the share of total agriculture in manpower is about one tenth; the share of manufacturing and trade will be 37 per cent in Austria and is at present 40 per cent in Switzerland.

The Gross National Product, derived on the basis of modified extrapolations of productivity growth per man in various sectors, will be about twice as high per head of population in 1980 than in 1961. In 1955 dollars, it will be about $1,730 per head; thus it will be considerably higher than the recent Western European domestic product ($1,328 per head in 1964), but it will be very much lower than the United States domestic product ($2,513 per head in 1964).

The implied assumptions about the rate of growth are based on experience in Austria and in Western Europe in the last fifteen years. Compared with the growth rates of the first half of this century, the present - and the projected - growth is extraordinarily rapid. In 1955 dollars, the per capita domestic product of Western Europe (at factor cost) has grown by about $9 annually, and the United States domestic product by $24 annually, in the period from 1899 to 1957.(1) From 1961 to 1980, however, Gross National Product per capita in Austria - according to our projections (Appendix IV, Table 47), which simply extend recent experience into the future and are in line with the expectations and ambitions of Western Europe generally - will grow by $46 annually. The reasons for the comparatively high growth rates of the second half of the century are: first, continuing full employment and, secondly, an extraordinary acceleration of the rate of technological advance (automation). In Europe, moreover, the growth rate in the first half of the century has been depressed by two major wars.

A special calculation has been made for the composition of the output in manufacturing. It has been assumed that the share of various manufacturing industries will change in the same way as it has changed in the OECD countries as a whole in the last six decades. This involves a large increase in the share of engineering and the chemical industries. In 1980 the structure of our manufacturing industries will, according to these projections, be similar to that of the OECD countries in 1959.

The graph below shows the evolution in the distribution of exports in the European OECD countries from 1899 to 1950 for a number of industrial products.

The structural change implied in this reorientation is an absolutely essential condition for assuring the future of our exports. Appropriate policies designed to ensure this structural change are essential preconditions for reaching the targets assumed at the outset (full employment and 4 per cent growth).

To round off the picture of the Austrian economy in 1980, we need the occupational structure. The validity of extrapolating past Austrian developments is very problematic here, for reasons which will shortly become obvious; we have to turn therefore to foreign data and base ourselves to some extent on an analysis of the occupational structure in a much more advanced industrial country - the United States.

The rise of the white collar worker in the United States has proceeded in waves. In the 1920's the number of sales workers rose by about 50 per cent, that of proprietors, managers and officials by 29 per cent. In the subsequent decades both groups increased much less. In

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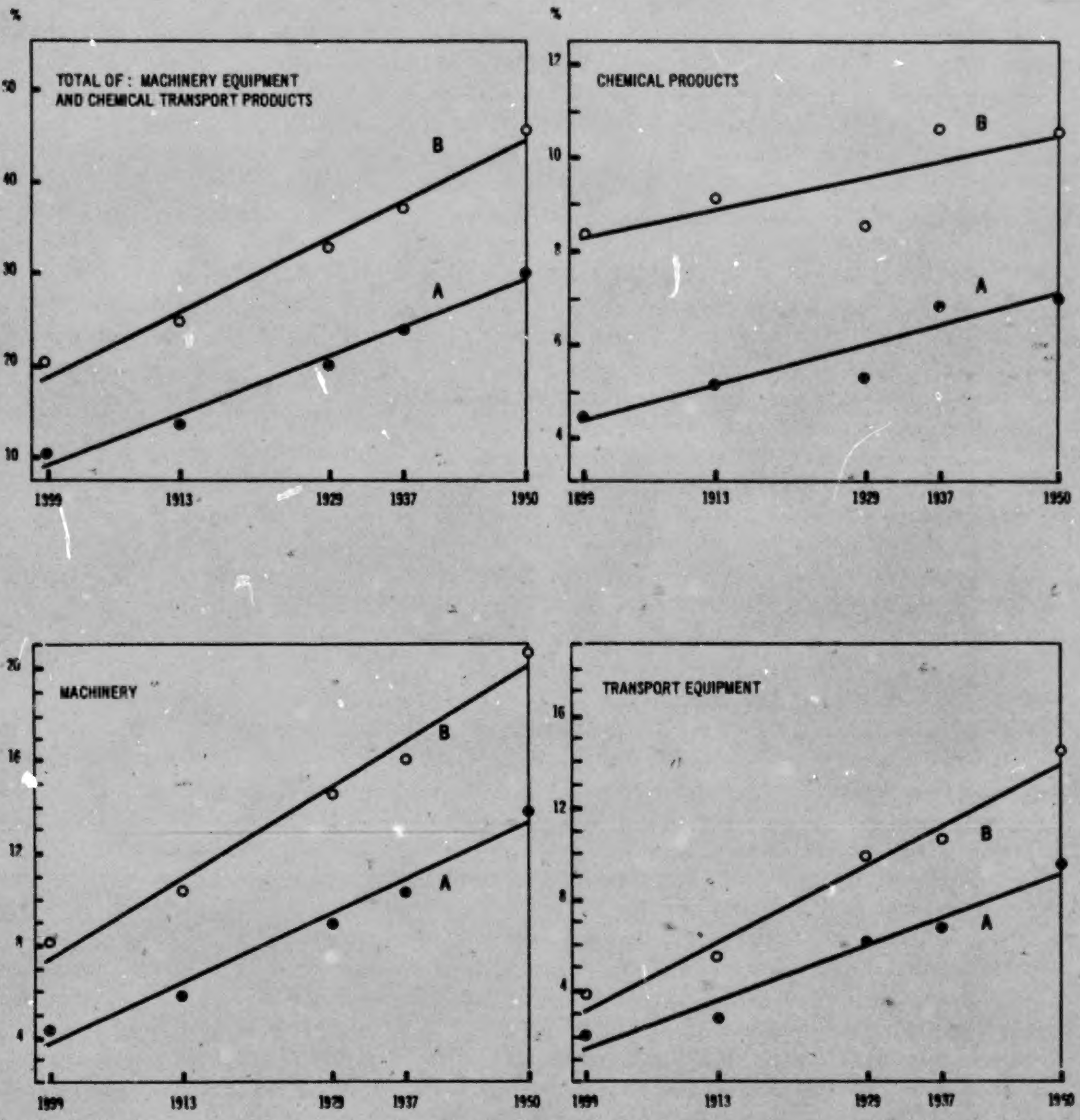
(1) Maizels: "Industrial Growth and World Trade", Cambridge University Press, London, 1963.

Graph 2

SHARES OF VARIOUS GROUPS OF INDUSTRIAL PRODUCTS AS A PORTION OF TOTAL EXPORTS OF THE EUROPEAN OECD COUNTRIES, 1899 TO 1950

A. Percentage share of total exports
B. Percentage share of exports of manufactured goods



the subsequent decades both groups increased much less. In the 1940's a boom occurred in the number of clerical workers, which rose by 45 per cent, an increase which slowed down in the following decade. In the 1950's the first place was taken by the professional and technical workers, whose number rose by 44 per cent. The following table gives a survey of the occupational trends of the last two decades.

Table 30

Increase in a number of occupational groups in the United States

	In thousands	Percentage rise
1920's		
Sales workers	+ 1,001	50
Professional and technical workers	+ 1,138	45
Proprietors, managers, officials	+ 811	29
Clerical workers	+ 951	28
Total manpower		15
1940's		
Clerical workers	+ 2,350	45
Managers, proprietors, officials	+ 1,385	37
Professional and technical workers	+ 1,202	31
Sales workers	+ 683	20
Total manpower		14
1950's		
Professional and technical workers	+ 2,243	44
Clerical workers	+ 2,386	33
Sales workers	+ 675	16
Managers, proprietors, officials	+ 334	5
Total manpower		10

Thus the boom of sales workers is over because of the rationalisation in sales methods, the growth of clerical workers has waned owing to rationalisation in the office, and the only group which continues, and presumably will continue, to rise rapidly is that of professional and technical workers.

The occupational structure of the occupied population in Austria in 1961 will now be compared with that of the United States in 1960. For the purposes of this comparison, the table below groups the occupations in Austria in a way which corresponds to the American classification; for direct comparison with the United States data, we have to take occupied persons inclusive of unemployed. More complete data on the occupational distribution in the two countries will be found in Appendix IV, Tables 50 and 51.

Table 31

Comparison of occupational distribution of United States and Austrian active populations - including unemployed

(1960 for the United States; 1961 for Austria)

Occupational group	Share of total active population		Share of non-agricultural active population	
	United States	Austria	United States	Austria
Technical and professional personnel . . .	11.3%	7.3%	12.1%	9.4%
Managers, officials, proprietors (excluding agriculture)	8.5%	8.7%	9.1%	11.2%
Office personnel	14.9%	8.4%	15.9%	10.8%
Sales personnel	7.4%	5.1%	8.0%	6.6%
Manual workers	39.7%	38.1%	42.4%	49.4%
Service workers	11.8%	8.9%	12.6%	11.5%
Farmers and farm workers	6.3%	22.8%	-	-
Not allocable	-	0.7%	-	1.0%

The table shows that we have a smaller proportion of sales personnel in Austria than in the United States - 5 per cent as compared with 7.5 per cent (excluding self-employed and employers); a much smaller proportion of office personnel - 8.5 per cent as against 15 per cent; and a smaller proportion of service workers - 9 per cent as against almost 12 per cent. The share of technical and professional workers is 7½ per cent in Austria, and more than 11 per cent in the United States.

The comparison is influenced by the fact that agriculture still accounts for a much larger share in Austria than in the United States. If we, then, base our comparison on non-agricultural manpower (including unemployed), we still find that sales personnel (6.5 per cent as compared with 8 per cent) and office personnel (11 per cent as against 16 per cent) are proportionately much less numerous than in the United States. The share of service workers is also slightly lower in Austria (11.5 per cent as against 12.5 per cent in the United States). The share of manual workers in Austria (49.5 per cent) is much larger than in the United States (42.5 per cent), and that of managers, proprietors and officials is also higher in Austria (more than 11 per cent as against 9 per cent in the United States), while the proportion of technical and professional workers is only 9.5 per cent in Austria compared with 12 per cent in the United States.

The changes in the Austrian occupational structure which have taken place between 1951 and 1961 have tended to make it more similar to that of the United States in almost every respect.(1) The numbers of sales and office personnel in Austria have increased, and the number of proprietors has decreased. The number of manual workers as a share of non-agricultural manpower has undoubtedly decreased. Only in one respect - and this is of very great importance - is there an exception: the share of technical and professional workers has increased very little in Austria. As a percentage of total manpower it has risen from 5.8 to 6.7 in the decade under consideration; and as a percentage of non-agricultural manpower, it has remained stationary at 8.6, while the share of this group in non-agricultural manpower grows by 2 per cent annually in the United States. This group contains the major part of the university graduates and a large portion of the people with secondary school education.

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(1) For the purpose of comparison with 1951 the classification of occupations has been changed to facilitate reference to data from the 1951 Census. Some smaller professional groups, which are included in technical and professional workers in Table 31, dealing with 1961, are excluded from this group in the present comparison with 1951 (and in Appendix IV, in the Annex to this chapter, Tables 52 and 55).

The impression of stagnation in the employment of technical and professional workers is reinforced by the fact that the stock of university graduates increased very little in Austria in the 'fifties (see Appendix IV, Table 53). The total, excluding art academies, etc., was 75,000 in 1961 as compared with 71,400 ten years earlier.

It is likely that the stagnation of the 'fifties in the employment of technical and professional people has continued up to 1965. This can be surmised from the numbers of university graduates which, if account is taken of emigration, scarcely provide the inflow of new personnel necessary for expansion of the total stock of such personnel.

What kind of future occupational structure would emerge if the trends observed in the period 1951-61 were extrapolated mechanically? The answer is given in Appendix IV, Table 52. This projection has been made on the basis of a cross-classification of manpower by industry and by occupation. For each industrial sector the change in the share of the various occupations between 1951 and 1961 has been projected into the future.

We have assumed here that the change in the shares of various occupations (just as we assumed above for the distribution of total manpower in the projection of the industrial structure) will depend not on time but on the rate of growth in the Gross National Product per head of population. The speed with which the shares of various occupations change in the period 1961-80 is thus assumed to be smaller than in the period 1951-61 (because the growth of Gross National Product per capita is slower). The extrapolation of the percentage shares, as a function of Gross National Product per capita, is linear.

From the projected percentage shares of the various occupations and from the projected distribution of total manpower over economic sectors, total manpower figures are obtained for each occupation for each sector; by adding up the totals for each occupation over all the sectors, one obtains overall figures for the various occupational groups, from which the percentage distribution of manpower by occupation is derived.

The future occupational structure derived from this mechanical projection (see Appendix IV, Table 52, last two columns) gives in general a plausible picture: the share of sales people, office people and service workers increases. In the case of the technical and professional workers, however, the projection leads to an implausible result: the share of this group as a proportion of total manpower increases during the period 1961 to 1980 from 6.7 per cent to only 7.6 per cent; as a proportion of non-agricultural manpower, it declines from 8.6 per cent to 8.5 per cent (Appendix IV, Table 52. The poor showing of this group results from the fact that its share of manpower does not grow very much either in manufacturing or in government, while in the sector "other services" (which contains, among others, education and health services) it even decreases.(1)

The data in Appendix IV, Table 52, represent an important intermediate result, but as far as the technical and professional workers are concerned, these results are a reductio ad absurdum of the mechanical projection: no industrial country at this stage of development shows a similar stagnation in the employment of these occupations. In other words, the calculation demonstrates that Austria would develop in an entirely abnormal way - in the light of the experience of other countries - if the trends observed in this field between 1951 and 1961 were to continue. A detailed analysis of the economic background of this paradoxical result of the mechanical projection will be found in the next section.

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(1) A further implausible feature is the reduction in the share of officials (and corresponding increase in the share of office personnel) in the government sector.

The conclusion is that we must build our estimates of future occupational distribution on alternative data. We assume that the share of the technical and professional group as a proportion of non-agricultural manpower will grow at the same rate in future in Austria as it grew in the United States from 1950 to 1960, that is at a (cumulative) rate of 2 per cent per annum. The share of the other occupations, starting from the intermediate results of Appendix IV, Table 52, have been reduced proportionately so as to make room for the increased share of the technical and professional group. The share of the technical and professional workers as a proportion of total manpower would now increase from 6.7 per cent to 11.6 per cent in the period from 1961 to 1980.(1)

The main results of the projection for the various occupational categories are given below. (The detailed results will be found in Appendix IV, Table 55).

On the basis of this anticipated future occupational structure, a rough estimate of the required number of university graduates can be made. The estimate rests on the assumption that the proportion of university graduates in each of the various occupational groups remains unchanged at the 1961 level. This assumption is not quite realistic: as will be shown further on, the proportion of graduates will increase in the case of managers and of officials, and will decrease in the case of engineers. It has been assumed, however, that these movements in opposite directions will cancel out, so that the share for the average of all occupational groups will be unchanged. (It should be noted that in view of the above considerations the distribution of graduates over the various occupational groups in Appendix IV, Table 55, is not quite realistic: the portion accruing to managers and officials will increase more strongly than is shown in that table).

We obtain, as a result of the above calculations, a requirement of 142,000 university graduates in 1980, compared with a stock of 87,000 graduates in 1961. The increment is thus 55,000. This estimate will serve as a guideline. A detailed analysis of various parts of the total requirement -- engineers, research and development personnel, teachers, social scientists - will yield results for individual sectors which can be reconciled with the above global estimate.

The refusal to extrapolate the trend of the last 15 years - as far as the technical elites are concerned - must be based on an analysis of the economic problems involved. Such an analysis is presented in the following section.

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(1) The above proportions are not directly comparable with those given for the United States for 1960 in Appendix IV, Table 49. If we add an allowance for the occupations not included in the above Austrian figure for the professional and technical group, we obtain a share of 12.7 per cent for this group in Austria in 1980 as compared with 11.3 per cent for the United States in 1960. Thus the proportion of technical and professional workers would, according to our projection, be higher in Austria in 1980 than it was in the United States in 1960, although the Austrian Gross National Product per capita will still fall far short of the present American level. This result is not implausible if we consider that the occupational densities do not depend on the national product per capita alone, but also on time: in 1980 the development of our production techniques, and therefore of our occupational structure, will in many ways have surpassed the present American development, even though for various reasons (less mass production, etc.) the national product per capita will still be smaller than in the United States.

Table 32

Projection of Austrian occupational structure, 1961-1980

(Active population excluding unemployed)

Occupational groups	Percentage share of active population	
	1961	1980
Technical and professional personnel	6.7	11.6
Managers, officials and proprietors (excluding agriculture and small proprietors in trades and commerce).	2.4	2.9
Sales personnel (including independent small traders)	7.2	9.3
Office personnel	8.6	11.4
Farmers and agricultural workers	23.0	9.9
Mining, manufacturing and transport workers (including small proprietors)	41.9	41.7
Service workers (including small proprietors)	10.2	13.2

2. The vital role of technical and professional personnel in effecting the necessary re-orientation of economic activity

The stagnation in the employment of technical and professional workers in Austria is in strong contrast to the development in other countries. Both in Great Britain and in the United States, an approximate doubling of the number of graduate engineers and scientists is officially envisaged for the period 1959-1970. The group of professional and technical workers in the United States increased by 44 per cent in the 1950's. In that country the number of researchers (graduates) increases by approximately 8 per cent per year.

How can we explain the contrasting development in Austria where the greatest prosperity in history coincided with near-stagnation in the employment of scientific and technical personnel? There is, first, the fact that in the past we were a country with an intellectual "oversaturation". We have therefore been able to live on an accumulated stock. Secondly, to the extent to which skilled manpower, and especially graduates, have become scarcer, management has reacted by dilution by various means, chiefly by deferring all tasks which could be deferred without jeopardising present output. This reinforced certain defects which were in any case present in Austria - in particular the stagnation of research and development. This is only part of a much more general phenomenon: the proportion of work devoted to long-term planning and preparation as opposed to routine operations is small in Austria. We are accustomed to improvising, to living from hand to mouth, and to being so submerged in routine work that we have very little time for anything else. Thirdly, we have improved our industrial capabilities by importing foreign industrial practice together with machines and technical assistance. Skills could therefore be economised to the extent to which they were imported in ready form.

If we extrapolated the experience of the last 15 years, we should find that we have very few additional requirements for highly skilled manpower. But we cannot extrapolate this trend, because we cannot forever draw on reserves of skilled manpower, defer tasks, and import skills ready-made from abroad. We are, in fact, in a period of transition where a break in the trend occurs. For this reason, an estimate of future requirements has to be based in many respects on foreign rather than on Austrian experience. The recent Austrian past would, in these respects, be a bad guide. The weight of my main argument rests squarely on the conviction that we are now in a period of transition; it is, therefore, necessary to examine more closely the reasons for this assumption.

One reason why we cannot extrapolate the past trend in the employment of technical and intellectual manpower is that this cannot be reconciled with our policy of integration, of the removal of protectionism, and of international co-operation.

The word "integration" as used here does not imply any specific policy vis à vis the European community. It simply means participation in the prevailing attempts to break down the economic barriers in Europe and to create, in a sense, larger economic units. Whatever specific arrangements we may reach with the European Community, the existence of the Community will in any case mean strongly increased competitive pressure on Austria, and an imperative need to be open-minded with regard to any changes that may be helpful in maintaining our prospects of growth. More specifically, the existence of the Community, together with the international efforts to reduce tariff barriers, will force us to abandon a very large part of the protection accorded to our industry.

To be "integrated" we must become more like other industrial countries in all essential respects; we must not become an industrially backward area or an area from which new industries and technical development are shut out. The fear that Austria might become just such an area has been evoked by those who are sceptical about the prospects of integration. Everything necessary must be done to allay those fears and counter those criticisms, and to make it impossible for such an eventuality to materialise. The policy of integration implies that, to a large extent, we have to give up our means of defence against a sudden deterioration in the balance of payments. We have, therefore, to be fully equipped for competition. Foreign trade is based more and more on technical achievements, at least as much for small countries as for large ones. The role which the favourable development of foreign trade in the last ten years has played in Austrian prosperity can hardly be exaggerated. In fact, full employment stands and falls with the balance of payments.

To these economic arguments have to be added political considerations: the other nations of Europe would hardly wish to see us become an industrially backward country, permanently accepting technical assistance from others. They expect us to give technical help to underdeveloped countries and not to become an underdeveloped country ourselves. Thus we should be failing in our international obligations and in our commitment to a policy of co-operation in Europe if we did not change the prevailing trend with regard to the employment of technical and intellectual manpower.

Basically, then, the break in the trend occurs because we are in a process of transition from a highly protectionist economic policy and tradition to a liberal, co-operative and open economic system. What is required, in the minds of those who opt for integration in the wider sense, is that we should get rid of those features of our economic life which constitute a harmful heritage and which distinguish us unfavourably from other industrial nations (such as Scandinavia or Switzerland:(1) the perpetuation of inefficient production, economic parasitism, a monopolistic or "cartellistic" or "corporativist" spirit in business, and old-fashioned methods of administration.

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(1) See K. Rothschild: "Österreich, Schweiz, Schweden. Ein Wirtschaftsvergleich". Beilage 77 der Monatsberichte des Österreichischen Institutes für Wirtschaftsforschung.

The forecast of these bad features is a lack of understanding on the part of our industrial, administrative and political leaders with respect to the value of science, technological innovation, research and education, and with respect to the value of intellectual achievement and skill in general. They are accustomed to assuming that intellectual and scientific brilliance is available at their beckoning. The lack of esteem for intellect in Austria extends even to the intellectuals themselves, who often value themselves as holders of office and of honours rather than as learned men. It would be quite contrary to the concept of integration as described above, which is directly against provincialism and seeks to cultivate an open spirit of co-operation and a willingness to learn from the best experience of other nations, if Austria were to opt out of the present international effort to use the potential of science systematically in the interest of prosperity and welfare.

We are in fact - even if all of us do not yet realise it - committed to a policy of furthering science and its applications in industry and administration at a pace and with resources comparable to those of other industrial nations. The argument that we have done quite well so far without bothering about "eggheads" does not stand up. There are numerous symptoms of the break in the economic trend mentioned above which make it impossible to think that we can go on as before. There is, first of all, the change in our export structure. The basic industries, the main cornerstone of our export markets in the past, have ceased to be very profitable, and we cannot rely on them any longer. It is obvious that our exports must be reoriented towards the more finished products, and especially towards the products which account for the bulk of the expansion of world trade today, namely, engineering, chemicals, electrical goods, and precision instruments.

A second alarming symptom is the fall in the rate of investment in manufacturing. A third symptom is the decline in productivity, which has already created a number of problems because it contributes to the tendency for prices to rise. The decline in the growth rate of productivity is connected with two facts: first, about 15 years ago in Austria, investing meant replacing very outmoded equipment with comparatively new equipment. The step from old to new techniques was a very large one. Investments made in the 1940's and '50's for the purpose of replacing very outmoded equipment were almost certain to produce impressive results. Secondly, it is argued that in the 1950's we could do without a new infrastructure and could live on that which we had inherited from the past. Now, however, the infrastructure has to be expanded. The coat has become too small and too worn for us.(1) The same is true for what may be called the intellectual infrastructure. Here, too, we have been living on the past and working with what has been left to us, but, again, the jacket has become too narrow and too worn.

One reason why a break in the trend should occur in Austria just now has been given above: that is, that we are in a period of transition from protectionism to an open system. Another reason now suggests itself: it is that we are in transition between two phases of industrial modernisation. In the past, our export problems were easy because we profited from the other countries' scarcity of equipment in the steel industry, in timber, and in various other basic industries. There is now adequate capacity in most of the basic industries in Europe, and prices are not as good as they were. We shall be obliged to shift the weight of our exports to different industries, mainly engineering, chemicals and so on.

Again, investment was easy in the first phase of modernisation because, as already mentioned, the step from old to new equipment was a very large one and it was easy to produce results from a modernisation which consisted simply of introducing well-known and well-established processes which had been used abroad for some time. In the new phase of modernisation, it is by no means easy to discover what we must do in order to increase productivity to the required extent. This question is further complicated by the fact that technological development in the world at large is now more rapid than ever. New industries are appearing - for example electronics and atomic power - and the question arises to what extent Austria should introduce these new industries and what character they should take. The development of new industries requires in every case a parallel effort in the fields of research and education.

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(1) See Hans Seidel: "Kein Rezept für Wachstum". In "Die Presse", (Vienna), May 1965, 15/16.

Applying the ideas about growth outlined in the introduction to this chapter, we might say that in Austria in the past 20 years investment, and not skill, has been the decisive factor in growth, because skill was imported ready-made: Austria was so backward in industrial practice that it could easily increase output per employee by importing the technology of other countries, such as the United States. This period is now coming to an end. We are still far behind the technology of advanced industrial countries like the United States, but if we are to catch up with them we can no longer imitate them and introduce their technology because most of it (for example large-scale production methods) is unsuitable to our conditions. We have to develop new technologies of our own, and we have to be ahead of the other countries in certain fields so as to compensate for the handicap in others.

This raises the decisive question of the role of research - whether we can do without it and live on imported knowledge by taking licences. This question is intimately linked with the question of our industrial structure and our exports. We need new technologies, not just for our home market, but even more for our export industries. Thus the problem is not to get licences for a restricted market; this may be relatively easy, especially for the plants affiliated with foreign firms (in some cases the taking of licences will restrict the sales policy of a firm so much and make it so dependent on the patent-owner that it is, to all intents and purposes, in the position of a foreign-owned firm). The problem is one of acquiring knowledge so as to be able to compete in foreign markets. Those who have experience in these matters will testify to the fact that it is not very easy to acquire know-how for this purpose unless you have some other know-how of equal value to offer in exchange.

The very misguided argument that our industry could live on imported licences neglects the fact that technical achievement is one of the most important weapons of competition and one does not give away such weapons for a song. Moreover the special needs and conditions of our industry will never be fully considered by others, and we shall have to think about them ourselves. It is well known that even licences require in most cases additional technical research before they can be used. It should be mentioned at this point that some of the most important problems of our industry are of an organisational nature - they concern production programmes, insufficient specialisation and so on - and it is clearly up to ourselves to find a solution to these problems.

As far as our export policy is concerned, there are two ways of holding our own: we can either rely on "social dumping", which requires that our real wages must remain permanently below those of our industrial competitors by a substantial margin, or we can compete on a technical basis, by offering technical novelties and products of exceptional quality. The industries adapted to our conditions are, in the first place, the engineering industries where small-scale production and small lots are the rule. In these industries, international competition means competition in know-how, research and skill. Social dumping would not, in any case, be very effective in these industries because quality matters most. The solution of "social dumping" is excluded by the desire of the Austrian people to catch up with the standard of living of more advanced industrial countries, and it is also to some extent in conflict with the aim of integration.

Since the opportunities for importing know-how have declined rapidly, and since we shall have to rely on research and on a re-orientation of our exports, skilled manpower has become the decisive growth element for the near future. Without it, our large investment rate will be barren.

The opportunities for productive investment from now on will not fall into our laps; on the contrary, we shall have to look very hard for them. We shall have to invent and to develop, in many cases, before we invest. This will require very much more skilled manpower than we have.

We shall also have to think about the structure of our industry. It is a characteristic of our present transitional period that we do not in fact know very well what to do with regard to industrial structure and with regard to investment. We should have this whole complex of problems thoroughly and systematically investigated by a team of scientists, engineers and economists. They should find out what we can do in the way of developing new industries and to what specific tasks such development should be directed.

This leads us beyond the question of scientific research to the more general need for foresight. The argument presented on these pages is that we could afford to neglect that need up to the present time; we could afford to confine ourselves to routine simply because we have been working under exceptionally favourable circumstances. These circumstances no longer exist and we, therefore, need a change of heart. We have to devote considerable effort to planning, which simply means thinking ahead. In practice, this means that additional staff, mostly of a very highly skilled character, will have to be hired in business and government in order to fulfil these hitherto neglected functions, which cannot be undertaken by existing staff because they are fully occupied with routine tasks and they are not suited by training and disposition to the new tasks. The implications for the estimated manpower requirements are obvious.

It is also evident that we cannot, in this matter, make any forecast properly so-called. A change of heart cannot be forecast. We can only say that this has to happen if we are to proceed on sound lines. If it does not, we shall probably not be able to keep up our present rate of productivity growth. The consequences of failure to make the necessary changes may not be spectacular in the short run, but may consist at first only of a deepening of the malaise which has already been felt for some time.

There is, however, a very greatly increased risk - if we neglect to undertake the kinds of re-orientation of our economic activity indicated above - that we shall run into serious balance of payments difficulties. The balance of payments, in fact, has already turned from a surplus to a deficit in the course of 1966. This development has not been surprising to a number of economists who have known the structural weakness of the Austrian export trade for years. If their diagnosis is correct, then the weakening of the balance of trade is not a temporary chance fluctuation, but a development which will give us trouble for a considerable time. Experience of other countries offers a number of examples of the rapidity with which the balance of payments situation may change, altering thereby fundamentally the basis of the economic policy of the country in question. The dollar shortage dominated the world trade situation for more than ten years after the war. The change to a state of affairs in which the United States themselves have been short of currency has been breathtaking. This change was very largely effected by the recovery of European industries.

There are certain signs that the change of heart referred to above is, in fact, beginning to take place. The establishment and continued operation of the Social and Economic Advisory Council is a symptom of this. Again, the Ministry of Finance has started to work out provisional budgets for a three-year period and will probably go on to five-year provisional budgets later on. We may base ourselves on a more general observation: certain projects, for example, big building projects, of a long term character have been undertaken (e.g. the clinics of the Viennese medical faculty which will not be finished until the 70's, the underground railway in Vienna, etc), and it is being realised increasingly that it is desirable to work out the economic implications of such projects. It has become clear that unpleasant surprises may result if this is not done. In other words, the need for re-thinking and thinking ahead for which this study pleads is being forced on us by certain technical necessities.

Another reason why we should expect that the prevailing policy with regard to the employment of highly skilled manpower will, in fact, change in the near future lies in the fact that the supply of this manpower will now improve. While until recently (in the early 60's) the stream of graduates from the universities has hardly been sufficient to provide for an expansion of employment in view of heavy emigration, this situation will probably change in the second half of the 1960's. We shall have, owing to the increase in the supply of graduates, the possibility not only of covering wastage but also of expanding total employment. And this possibility will be eagerly used by the employers because there is now quite a large unsatisfied demand for engineers, etc. both in public administration and in private industry. The more abundant supply may induce the employers not only to fill the routine posts which are now vacant but also to create new posts in research and planning of the type mentioned above, because the inflow of new graduates will change the climate in industry and administration in favour of more research and planning activities; the new men will have new ideas and create new tasks, thus activating the latent demand for highly skilled personnel.

This brings us to a further variation on the theme of a "transition period": we are in a transition from a state of oversaturation with intellectuals to a state of scarcity. Ten years ago there was hardly any sign of a scarcity of intellectual labour; now there is definitely such a scarcity, but it is by no means as critical as in other countries. On the other hand, there is very severe scarcity of unskilled labour. This, in a way, illustrates our preoccupation with routine jobs. The tasks of the cleaners and waiters cannot be deferred until tomorrow or next year or later. The tasks of the researchers and planners can be so delayed and are. But a continuing scarcity of unskilled labour will lead us to a situation from which we can escape only by automation and similar means which demand the very activities of planning and research which we now neglect.

3. The future role of automation and its consequences for the occupational structure

The scarcity of labour, including clerical labour, is one of the main reasons for expecting automation to make considerable headway in Austria in the next ten years. A more basic reason is that we can achieve the required rate of productivity growth only if we avail ourselves of the opportunities of automation. The following types of automation will be referred to in these pages:

1. "Detroit-Automation. This is the kind of automation which has become famous by its application in the Ford motor works. It involves linking together the elements of the production chain by means of automatic transfer devices so that the work passes through the whole production process without human intervention. This kind of automation is adapted to very large-scale production and is not, therefore, very widely applicable in Austrian conditions. Nevertheless, we can and do apply it as partial automation - i.e. for individual portions of the production process - in vehicle production and in electrical engineering.

2. Automatic processing of data by means of electronic computers. This is a form of rationalisation of office work, for example, the calculation of the payroll. A computer applied in this way will save clerical labour, office space, etc. In other cases, for example, when applied to accounting, it is also essential that the computer saves time and makes it possible to achieve something which otherwise could not be done, namely, to get up-to-date information (e.g. balance sheets) at very short notice. A computer can also be used to solve decision problems in planning; for example, it can decide how the work load should be distributed over various machines to achieve the best utilisation of capacity or the lowest cost.

3. Control by programme: this is the directing of machines according to blueprints which are fed into the automatic control mechanism by means of a tape. This method is mainly used to control machine tools, and is particularly suitable in the case of short production runs where, for example, 25 or fewer units of a product are produced. The method is thus particularly suitable for small-scale production which prevails in engineering. It was initiated only recently, but is now developing very quickly in the United States, and is beginning to be used in Austria (by the Heid engineering works).

4. Process control systems: this is the direction of production by means of a computer which acts on information received from the production machinery and adjusts the machinery correspondingly (closed loop system). Chemical production, petroleum refining, steel rolling, paper production and so on can be controlled in this way. The method can also be applied to management as distinguished from production, for example, to the control of inventories, and to the re-ordering of goods in retail stores. The computer here acts on the basis of information received about the size of stocks of individual goods and proceeds automatically to order the goods which are in short supply. In the same way, production can be scheduled automatically, and raw materials ordered as needed, in response to incoming orders which are distributed by the computer in optimum manner over the machines or department of the factory.

Automation in the strict sense of the word started only in the early 1950's. Its development has been extremely rapid and new improvements and innovations are being introduced all the time. At the end of 1954 there were only 500 computers installed in the United States, whereas at the end of 1964 there were 22,500 (excluding military and process control). The figures given in Appendix IV, Table 70, on the number of computers installed in the United States show a fairly regular increase of about 40 per cent per year on the average in the last five years. This implies that computers increasedthirty-fold in ten years. The increase in computers in Europe, where the density is still small, is even more rapid than in the United States; the rate of increase has been about 70 per cent per year in the last three years. There are now 350 computers per million of non-agricultural manpower in the United States as against 65 in Europe and about 40 in Austria. The Automatic Information Processing Research Centre in the Netherlands has estimated that the number of computers in the European community will increase tenfold from 1961 to 1970; but the development has already outrun the predictions because the growth has been steeper than forecast.

If we base ourselves merely on the American rate of growth, we should expect to have 2,000 or 3,000 computers in Austria by the middle of the 1970's. If we assume that by that time we shall have reached only the present "American computer density of 350 per million of non-agricultural manpower, we shall at any rate have more than 1,000 computers by that time.

This, in fact, seems to be the most conservative estimate that can be made.

Such an estimate may seem surprising in view of the relatively small number of really large firms in Austria, but many big enterprises will need more than one computer and, furthermore, computers will also be used by medium and small firms, probably through the intermediary of servicing centres. Such centres have been very successful in the United States where it has been shown that even quite small firms of, say, 25 employees can use them for payroll calculations provided only that the accounting is standarised so that the centre can treat the calculations for many firms in exactly the same way. A series of payrolls from various firms is processed by the computer in one run; only the imprint changes, so that each firm's payroll is preceded by its name.

As the result of a comparatively recent development, computers can now be directly linked by telephone cable. This makes remote control possible. The American Telephone and Telegraph Company expects communication between computers in different towns to exceed voice communication over telephone lines by 1970. This linking of computers geographically far apart increases the advantages which automation offers to very large firms by enabling them to master the difficulties of organisation and control in a vast bureaucratic system. It should be realised that this applies to governments as well; their tasks will be immensely facilitated once they discover the uses to which computers can be put. On the other hand, computers are, as shown above, perfectly capable of being used by small and even very small firms provided the proper organisation is set up (standardisation of accounting, etc.).

What are the effects of computers on the occupational profile, that is, on the proportion of various skills in the total manpower employed? It is generally assumed that a greater proportion of skilled labour will be required. The Netherlands Automatic Information Centre mentioned above has tried to estimate the number of specialists required for the computers which will be installed in Europe by 1970. The Centre considers that about 15 to 20 employees are neededfor one computer; of these, seven (35 per cent) are programmers, six (30 per cent) are systems analysts, five (25 per cent) are operators and two (10 per cent) are maintenance personnel. These estimates it is true seem to be too high in the light of present-day practice in Austria. The educational level of these specialists probably corresponds in most cases to secondary school graduation supplemented by additional special training. The approach of the Netherlands Centre (starting from the number of computers) is very useful but their analysis does seem to overlook the most important factor: the decisive thing is not the more or less routine work of programmers but the much more highly specialised work of people who tell you what the machine should be used for. These are the operational researchers who can find out what problems of decision-making the machine is capable of solving. The same kind of specialists are probably best suited to finding out how a firm should be reorganised so as to make it possible for the computer to be used to the best advantage. Their training represents a combination of mathematics and some other fields, for example, management, economics or engineering.

The availability of such specialists is a precondition for the efficient use of electronic computers. Without them, the computers remain inadequately used. In fact, just as telephones were once a status symbol for the manager, computers today are very often a status symbol for the firm owning them. In many cases, the simplest kind of use to which a computer can be put, for example payroll calculations, shows a return justifying the investment, but not nearly as high a return as could be obtained by a proper exploitation of the possibilities of the equipment. In this connection, we may quote the Congressional evidence of Mr. John Diebold, a well-known expert with very wide experience in electronic computers:

"New applied sciences have developed in the last few years which have centered about the

> concepts of automation; these sciences have synthesized the worlds of mathematics, electronics and business. As business grows more sophisticated in its applications of automation, the demand for management personnel trained in these sciences will grow. Now is the time when these people should be trained. I feel quite strongly that this task of training management personnel who can make the fullest use of automation concepts and techniques is not being carried out". And further: "One of the bottlenecks, then, in making the fullest use of automation, may very well be the lack of adequately trained management manpower".(1)

The proper use of a computer thus calls for particularly highly skilled manpower on the university graduate level; the kind of manpower, and the training required to produce it, are not easy to define, and this is probably why there is no generally accepted name for this category of personnel. We may, for the purposes of this discussion, agree to call these people systems engineers, independently of whether they work in production and are actually trained engineers, or whether they work in office automation and are trained operational researchers. Their job is, in any case, to define appropriate tasks for the machine and to design the system according to which it is to function. The work of the systems engineers, which may take several years to complete, is an addition to the investment in the machine proper.

What purpose do these people serve? The most elementary fact about office automation is that if it is applied naively and unimaginatively, it will turn out a flood of paper with an immense quantity of data which nobody can digest and read. A mathematical statistician is needed to enable the machine to digest and prepare the data and to deliver answers to reasonable questions.

This, however, is not all. The computer ought to be used not just for processing data but for actual control of operations on the basis of the data which it receives. In other words, it should work as a cybernetic system. The accomplishment of this task is greatly impeded by the traditional organisation of firms. The experts are agreed on the point, extremely well put by Stafford Beer,(2) that to make effective use of computers one must reorganise the firm from top to bottom. The moment the computer is placed in operation, it is no longer possible to maintain a departmental division of responsibility, either between production and administration or between the various functions within either of these two. Cybernetic control has to be designed, in principle, as a whole system for the totality of the operations. If, on the contrary, the computer were used to organise the processing of data department by department, it could never accomplish more than mere computation and could not act as a controller.

This points up the difficulty of prescribing the proper training for what we call the systems engineer. Herbert Simon(3) thinks that persons trained in fields like servo-mechanism engineering or mathematical economics, and who are accustomed to dynamic systems and possess the conceptual tools to understand them, will be most likely to meet the requirements. Hence, on the production side of the job, the servo-mechanism engineer will be the proper answer.

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(1) "Automation; Implications for the Future", edited by Maurice Philippson, Vintage Books, New York 1962, p.21.

(2) Stafford Beer, "The Electronic Firm", in Penguin Survey of Business and Industry", Harmondsworth, 1965.

(3) "The Corporation: Will It Be Controlled By Machines?" In "Automation", Vintage Books, New York 1962, p.258.

For the management side, on the other hand, we need people trained in operational research, mathematical statistics and with experience in business organisation. It may be that, as Herbert Simon says, a training in mathematical economics will be useful, too. It is therefore suggested that the institution of a graduate course in the universities which combines an extensive training in mathematics, mathematical economics, operational research and mathematical statistics will be of the greatest importance for automation. These subjects are closely connected and it is rather economical to combine their study in one course. The graduates trained in such a course would be useful in many fields, both in government and in industry, on account of the adaptability. The availability of such personnel is in fact a precondition for the proper use of automation. The systems engineer in our sense will be a bottleneck, second only, conceivably, to the limited preparedness of business and government to install computers and undertake the necessary reorganisation which must precede their application. How many personnel of the type described will be needed? It is almost certain that the number of computers in the middle 70's will be greater than a thousand in Austria. If on the average only one of these highly trained specialists per computer is required then it will be very difficult to train the required numbers in the time available. It is therefore advisable to do as much as possible and do it as quickly as possible to train such people.

In addition to this highly skilled personnel (systems engineers) there will, of course, be a need for less highly trained personnel (programmers,etc.). If we assume 5 to 10 per computer, we obtain a requirement of 5,000 to 10,000 of this group in 1975. These will be persons of the secondary school level with brief additional training. They might be trained in part in the secondary-level Business Academies (Handelsakademien) provided the kind of training which these schools dispense is greatly modified and is adapted to the requirements of the automated firm. It needs to be stressed, as a general matter, that as a result of automation most of the traditional methods of commercial and management training have become outmoded and must be completely refashioned. This applies both to the Business Academies and to the university-level School of Commerce (Hochschule für Welthandel).

4. Research and development as a major element in the social and economic infrastructure

The question of the role of research in Austria is a crucial one, and one to which all our arguments apply with particular force. We in Austria have to our credit great achievements in the past, we have gone through a phase of stagnation during the last decades, and we must expect to change the present state of affairs if we wish to avert a very bad future. The expenditure on research and development as estimated in a recent study by the Vienna Chamber of Workers(1) is about one third of one per cent of Gross National Product. The number of graduates occupied in research is less than 1,500, of whom about 600 are working in manufacturing. The percentage of employed graduate engineers and scientists who are used for research and development is about 5 per cent, as compared with 29 per cent in the United States.

We shall not compare expenditure on research and development in Austria with that in countries like the United States or Great Britain, countries which are very much bigger and which devote considerable expenditure to defense. We may, however, make a comparison with, the Netherlands, for example, or Scandinavia. In most of these countries, expenditure on research and development amounts to about 1½ to 2 per cent of the Gross National Product, and the percentage of scientists and engineers employed in research is much greater than in Austria.

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(1) "Forschung und Entwicklung in Österreich", Vienna, 1965.

The question of the future trend and scope of research in Austria is crucial for the estimate of requirements of highly skilled manpower; although the numbers involved are relatively small, the quality of the people required is particularly high, and these people are therefore rare. To use a very simple but practical argument, you have to train a rather large number of people, some of whom will turn out to be of indifferent quality, in order to get the required small number of top scientists.

If we wish to forecast research requirements, we must first of all realise that research does not depend on current production. If anything, the requirements for researchers will be connected with output a good many years hence, but even that connection is very loose. A sounder approach is this: research and development, together with higher education form an important part of the infrastructure of society. We need to have these activities just as we need to have roads and bridges; and, as with a road or a bridge, we must build capaciously enough to avoid serious bottlenecks, and we need not worry about whether the bridges will be fully used all the time. The infrastructure has to be there and to some extent it has to be there in advance of need.

In estimating the scale of the required research infrastructure, we must, first of all, consider the variety of specialists and fields necessary. Variety is important if we are to provide for fertile contacts and exchanges across lines of specialisation. Large-scale research and development projects today demand the co-operation of scientists and engineers belonging to many different fields; the development of atomic energy and of rockets, as well as space research, are obvious examples of this. Another example is the development of cybernetics by Norbert Wiener and his colleagues, who came from the most diverse fields, including medicine, physics and mathematics. Projects such as these could never have been initiated if a ready supply of specialists of the most varied types and with varied interests had not been on hand. We cannot foresee with certainty the combination of fields that will be required tomorrow; we know only that we need a sufficiently broad range of specialists.

It is pertinent, in this connection, to cite the theory of Ayres, an American sociologist, who explains the important technological innovations as the result of a meeting between various cultures or cultural elements which, by making possible a combination of ideas, has produced such great advances as the invention of printing, the results of a combination of ideas from China with ideas originating in Europe. On a more familiar level, it is obvious that the intellectual life of scientists and scholars depends on the exchange of opinions, impressions and experiences which, to be fruitful, requires a certain variety in the interests, experiences and subjects covered. This variety, in turn, requires a minimum scope of research. This is probably the decisive criterion for the size of the infrastructure.

If a country's intellectual infrastructure dwindles to below a certain order of magnitude, it will begin to crumble. The best people will leave the country and look for a more stimulating atmosphere. This will further reduce the possibility of doing interesting work and will initiate a vicious circle. The country will cease to count among the nations of the cultural world.

We are in danger of travelling along this road, and in fact we have already gone very far on it. There is no doubt that a decisive effort to foster research will have to be made in the near future. This will probably require the initiative of the government which, by participating in the research projects of industry - in fact by subsidising such projects on a 50/50 basis - can achieve as much as, or more than, the American government achieves by subsidising research for military purposes.

C. Projection of Requirements for University Graduates

1. Research personnel

In view of the above considerations it is proposed that the research infrastructure could be built up to the proper scale in Austria if expenditure for research and development were increased to 1 per cent of Gross National Product, that is, to three times the present level. This is also suggested in the study of the Chamber of Workers cited above. This should involve a doubling of the numbers of graduate engineers and scientists employed in research and an increase of 50 per cent in expenditure per graduate researcher. This would cover a certain increase in salaries as well as quantitative and qualitative improvements in the equipment available and an increase in the number of auxiliary workers. By doubling the number of professional research personnel, we would have - for 1961 - 1,310 scientists and 1,390 graduate engineers engaged in research, instead of the actual figures of 655 and 695.

A second requirement concerns the trend. In the United States the number of researchers increases by 7.2 per cent per year (compound rate of growth) in relation to the number of manual workers. This corresponds approximately to a doubling of the research personnel in the course of ten years, a rate of increase which is recommended by UNESCO. If we apply these rates to the Austrian figures (the number of manual workers according to our projections is expected to be the same in 1980 as in 1961), we obtain a figure of 5,150 scientists and 5,470 graduate engineers in research in 1980. The proportion of scientists and graduate engineers employed in research would then be approximately one-fourth, as compared with 29 per cent in the United States now. Thus a more reasonable proportion would have been attained. The requirements for expansion are based on the idea that we should not fall behind other countries.

In the past, the scope and variety of our intellectual infrastructure has been based on the influx of intellectuals from the old territory of the monarchy. To enable us to reach the targets set for the expansion of research, as well as the targets which have to be set for higher education, we shall in the future have to import scientists of high quality.

2. Engineers

Since graduate engineers and secondary school engineers can be substituted for each other to some extent (in production although not in research), we shall, at the outset, treat the two together. Our calculations start with the date of the population census of 1961 and, as far as manufacturing is concerned, with a special enquiry of March, 1958. It is assumed that by that time a rough equilibrium had been reached, in such a manner that the surplus had been largely absorbed and, on the other hand, no large unsatisfied demand existed. A comparison of the population censuses of 1951 and 1961 indicates a decrease in the number of occupied graduate engineers during the 1950's - probably due partly to the fact that many graduate engineers had formerly been employed in jobs where they were not really needed. This oversupply of engineers has been gradually absorbed and has given way to a situation of scarcity. A comparison of the special inquiry of 1958 with a similar inquiry at the end of 1964 shows no significant change in the number of graduate and other engineers in manufacturing.

Three approaches to the problem of requirements are considered here. The first approach is based on the growth of the volume of production. It can be argued that the employment of engineers increases with production, but not at the same rate unless the number of plants or building sites is increased. If the latter remains constant, the employment of engineers will increase less rapidly than the volume of production. On the other hand it will increase more than will total employment. It probably will increase at a rate which is nearer that of growth of output than that of the growth of total employment.(1)

The second approach starts from the simple observation that the technical density, that is, the ratio of engineers employed to total employment, increases in the course of time as a consequence of technological development. One can assume, on the basis of past experience at home or in other countries, certain rates of growth of these technical densities, and on this basis one can estimate the requirements for engineers. Data on the density of engineers (number of engineers per 100 manual workers) in the United States since 1900 are given in Appendix IV, Table 65. An exponential trend can be fitted to these data according to the formula

$$y = y_o \, e^{bt}$$

where y is the number of engineers per 100 manual workers and t is the time in years. The following values are obtained for the parameter b:

	b	Correlation coefficient
Technical engineers	0.0363	0.998
of which:		
Civil engineers	0.0184	0.971
Chemical, metallurgical and mining engineers	0.0369	0.984
Electrical and mechanical engineers	0.0466	0.998

It is remarkable that this trend remains unchanged in the course of six decades. There is no acceleration of the growth rate in the 1950's, as one might expect as a consequence of rearmament. The trend can be seen in Graph 3 below.

The density of engineers can also be regarded as a function of the Gross National Product per capita. The formula is the same as above, except that time t is replaced by Gross National Product per capita.(2) The correlation is somewhat less close than in the

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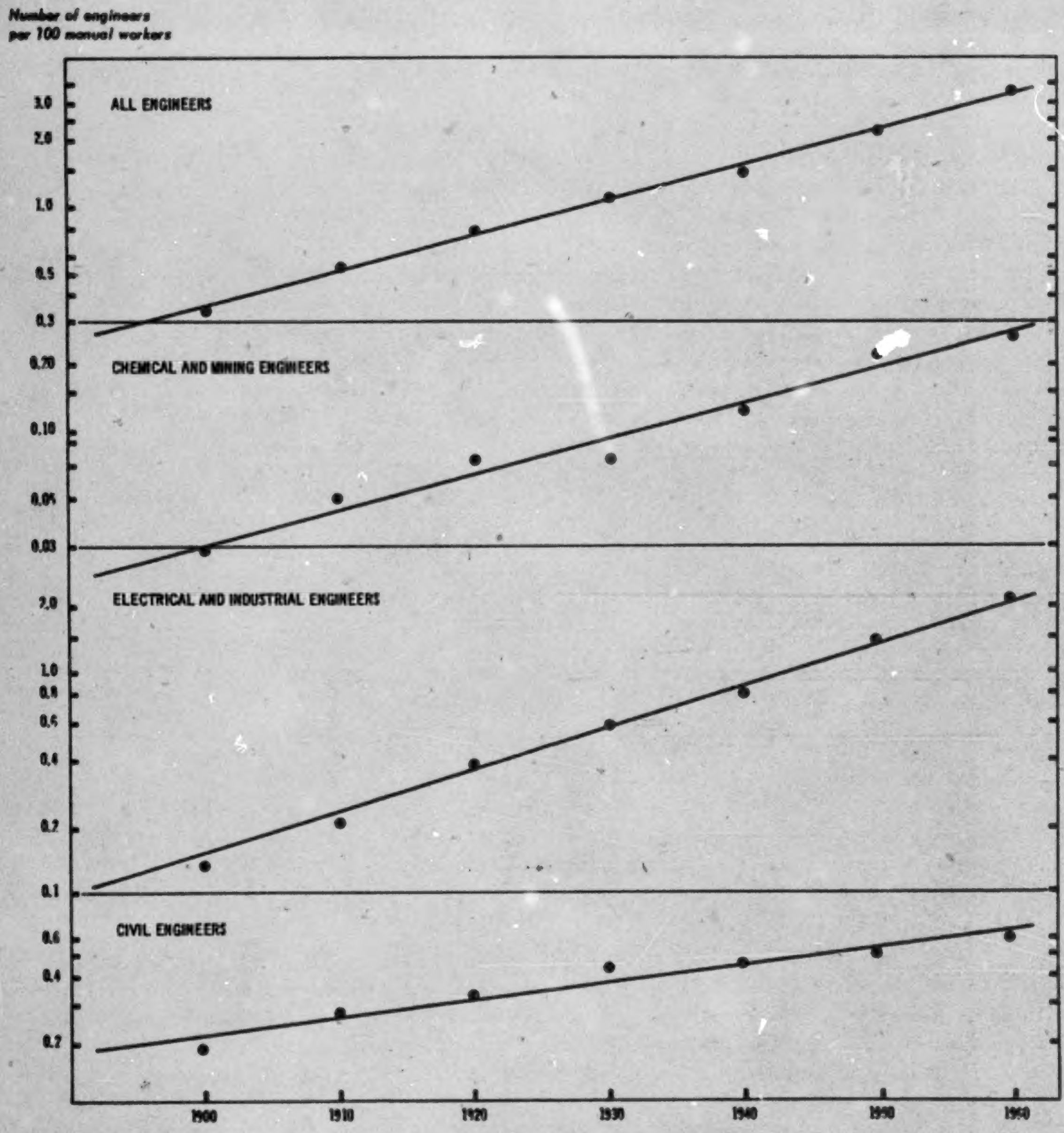
(1) M. Charkiewicz: "Planning of the Qualitative Reproduction of Human Resources", Central School of Planning and Statistics, Advanced Course in National Planning: Teaching Materials, Vol.12 (Mimeographed), Warsaw, 1963, p.44.

(2) The data used (densities) are the same as in Appendix IV, Table 21, the data for the national product the same as in Appendix I, Table 42.

Graph 3

DENSITY OF ENGINEERS IN THE UNITED STATES, 1900 TO 1960



previous case, but this does not necessarily mean that the relation is less meaningful economically. The fact that the densities in the 1930's are above the regression line is easy to interpret (low utilisation in the depression). The evolution of engineer density as a function of domestic product per capita in the United States is shown in Graphs 4 and 5 below.

The values of parameter b are now as follows:-

	b	Correlation coefficient
Technical engineers	0.00131	0.977
of which:		
Civil engineers	0.00064	0.896
Chemical, metallurgical and mining engineers	0.00138	0.981
Electrical and mechanical engineers	0.00167	0.957

This means that for every dollar of additional Gross National Product per head the density of engineers grows by 1.3 per thousand.

An analogous calculation has been made for the Netherlands. The parameter b for all (graduate) engineers, on the basis of a national product converted to 1954 dollars, is 0.00218. This means that the density of engineers grows by 2 per thousand for each dollar's increase in the Gross National Product per head. The growth is thus greater in the Netherlands than in the United States.

Graphs 6 and 7 show the growth of engineer density in the Netherlands.

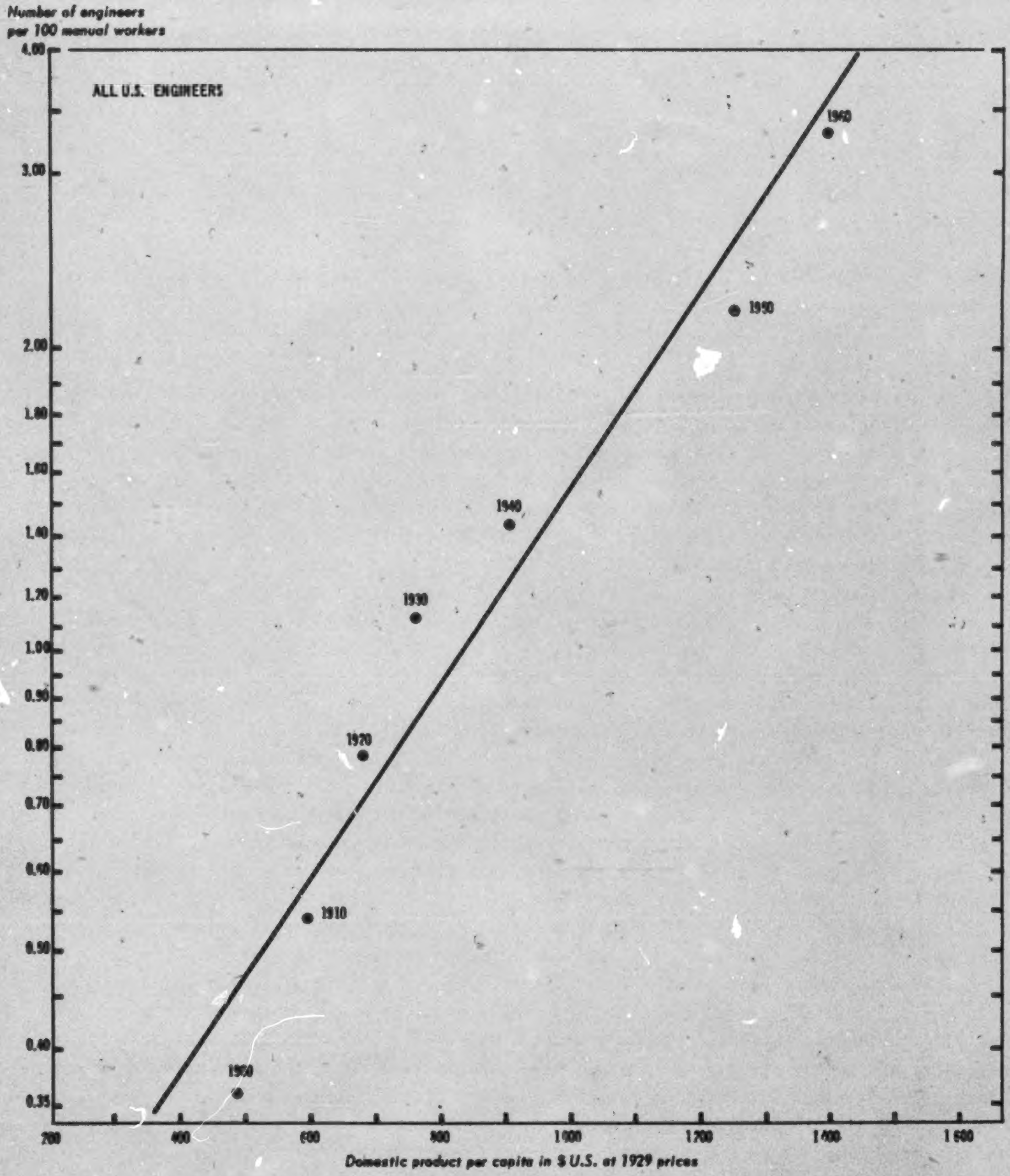
A third approach starts from a comparison of the technical densities in different plants or firms at one and the same time. If it is assumed that the average of the branch will reach the technical density level of the "best" firms after a certain period of time, this will yield an estimate of the requirements. We have used the data of the 1964 inquiry into manufacturing in order to apply this method.

It may be noted that from the point of view of an economist all these methods really miss the essential point because they relate the requirements for engineers to the level of production. Only a part, and not the major part, of the requirements are dependent on the level of output. For example, the number of civil engineers in construction, and the number of people drawing up projects in the engineering industries, are dependent on the level of production. But the bulk of the requirements are a function of the change in type of output and in methods of technique rather than of the level of production. This is obviously the case with respect to those engineers who are employed in research, where requirements are connected with future changes. There is also a large category of engineers who are concerned with the application of new production methods. Again, there are engineers concerned with advising customers on the use of new products. The requirements for such engineers clearly depend on the number and extent of the changes which are carried out currently. We cannot consider this point explicitly in our method of calculation because that would require quite new and unusual data (about future investments by type of process) and a new approach not usually employed, but we can take it into account implicitly in arriving at a balanced estimate of the requirements.

The first of the three approaches mentioned above has been applied in manufacturing. We have also tried to take account of the expected change in the structure of the industry: it

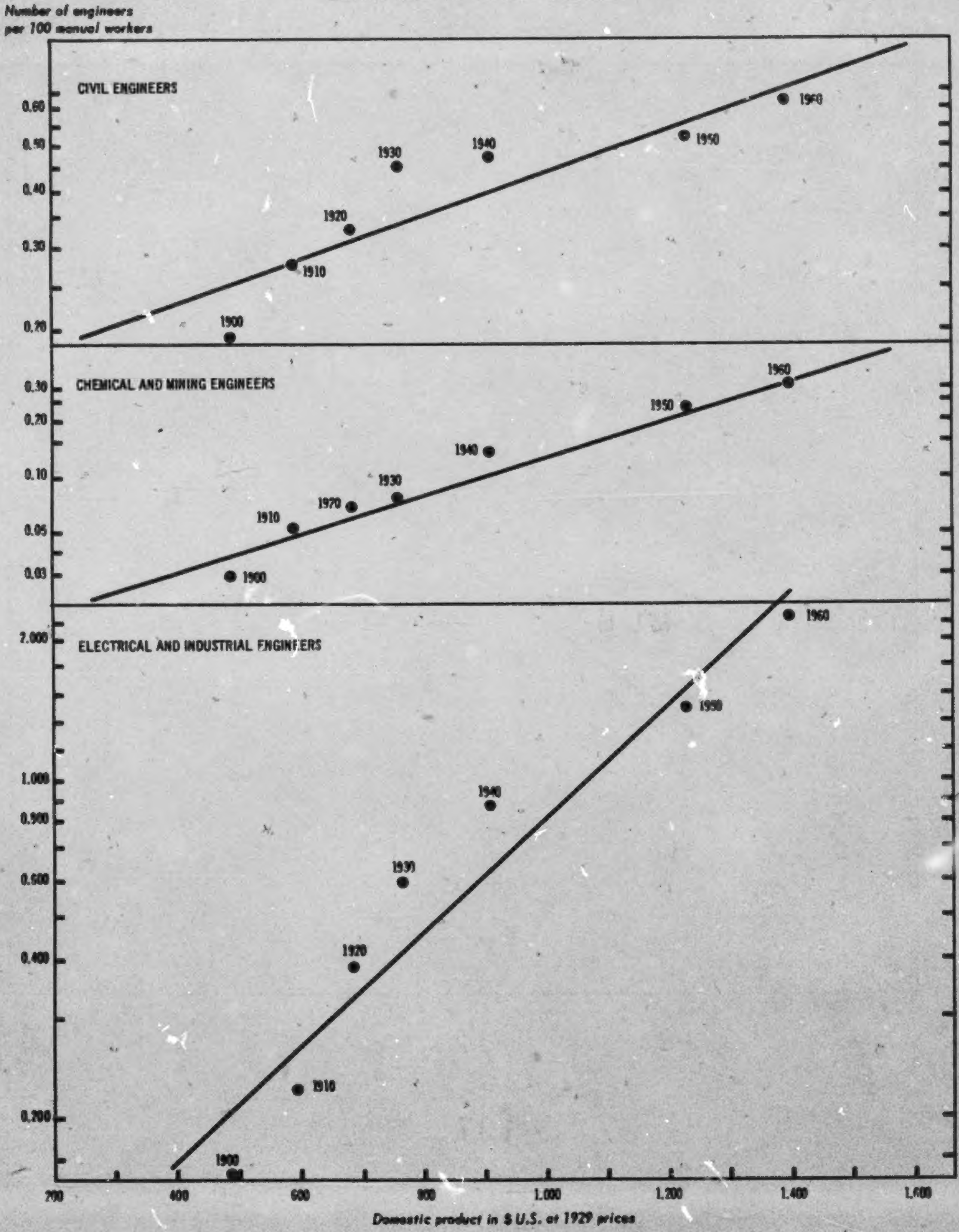
Graph 4

DENSITY OF ENGINEERS IN THE UNITED STATES AS A FUNCTION OF DOMESTIC PRODUCT PER CAPITA, 1900 TO 1960



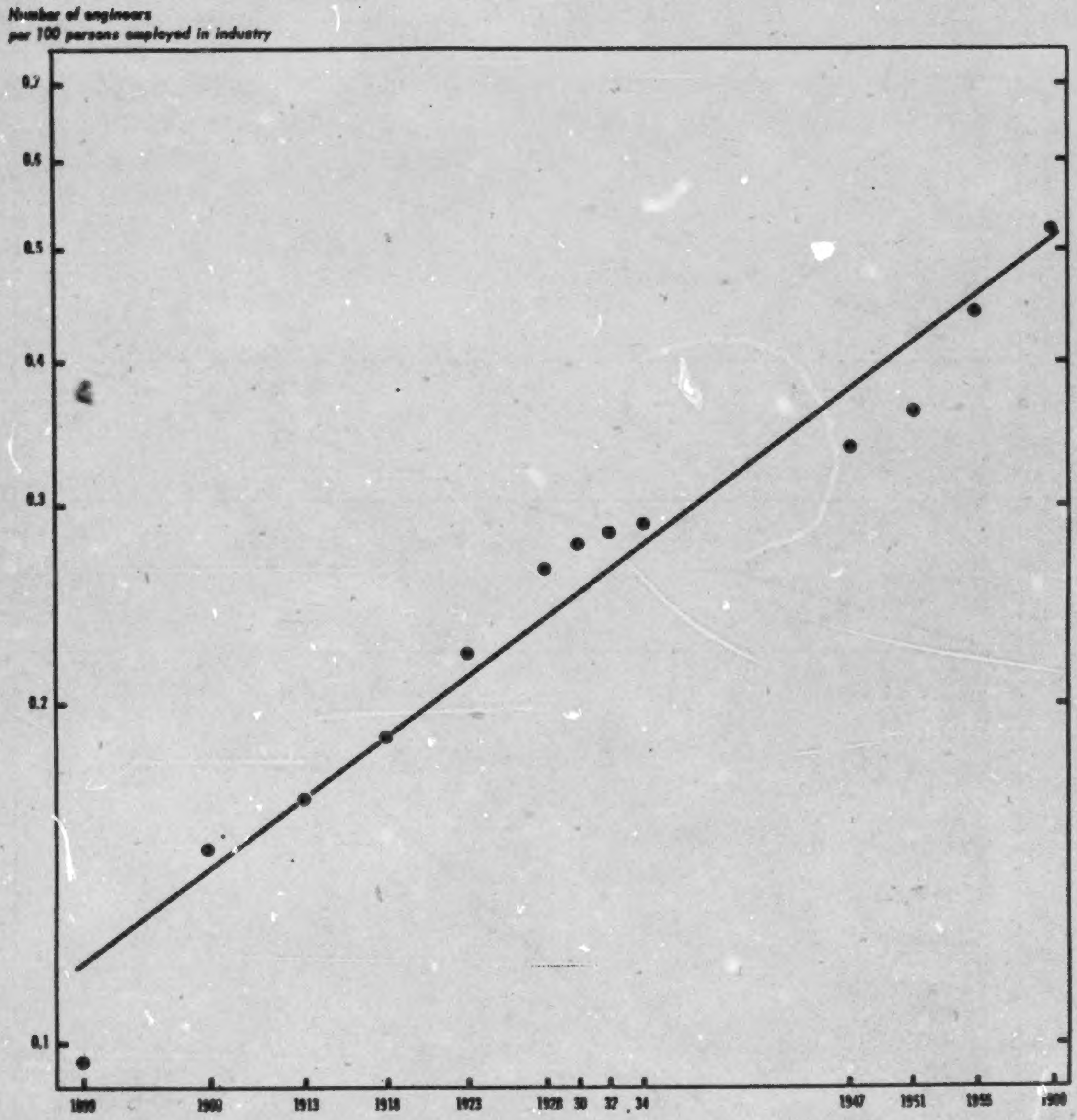
Graph 5

DENSITY OF ENGINEERS IN THE UNITED STATES AS A FUNCTION OF DOMESTIC PRODUCT PER CAPITA, 1900 TO 1960 BROKEN DOWN BY TYPE OF ENGINEER



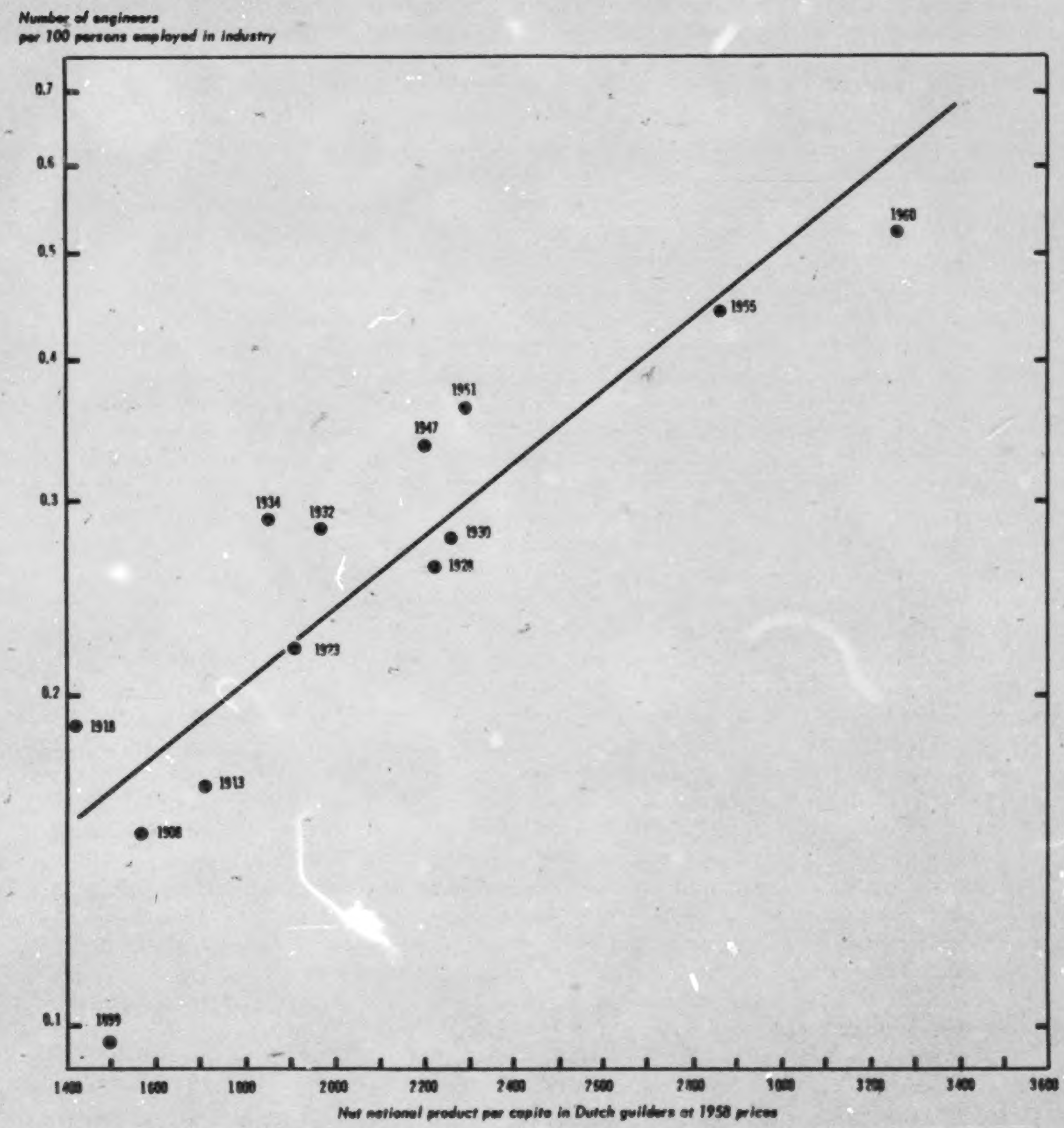
Graph 6

DENSITY OF ENGINEERS IN THE NETHERLANDS, 1899-1960



Graph 7

DENSITY OF ENGINEERS IN THE NETHERLANDS AS A FUNCTION OF NET NATIONAL PRODUCT PER CAPITA



has been assumed that the proportions of output of various manufacturing industries will change in the same way as in the OECD countries in recent decades and that by 1980 we shall have the manufacturing structure depicted in Appendix IV, Table 49. On this assumption we have calculated how many engineers would be required if their employment increased in proportion to output and have retained, as the figure to be used in our projection, three quarters of the additional employment obtained in this way. In making this assumption, it has to be kept in mind that the structure of industry will change not only in terms of the distribution of total output over the various industries, but also in the composition of the production of individual firms and plants,which will evolve towards more complex and technical types of products.

On this basis we obtain an increase in requirements for all engineers in manufacturing from 13,000 in 1958 to 37,600 in 1980 - a nearly threefold rise. (The increase in total employment in manufacturing in the same period accounts for an increase to 1.3 times the original level). This does not take full account of research requirements, which according to our assumptions will increase even more rapidly so that a correction has to be made. The above calculation implies that the technical densities in the course of the 22 years covered will more than double; to be precise, they will increase by 3.55 per cent compound per year.

It is assumed that of the total requirements for engineers in manufacturing in 1980 one fourth will be for university graduates and the rest for secondary school engineers. This implies that the ratio of secondary school to graduate engineers, which had been about 2 : 1 in the past, will increase to 3 : 1. This corresponds to actual demand tendencies and to the frequently expressed opinions of manufacturers about the desirability of a higher ratio. In fact, it is often heard that a much higher ratio, for example 4 : 1, would be desirable. It has been judged preferable, however, to be rather more cautious about this change and not to assume that it will go too far because there are tendencies working in the opposite direction.

For other industries, the following assumptions have been made: for electricity, gas and water an increase of 3.5 per cent per year in requirements; and for the building industry an increase in proportion to the increase in output; of the resulting additional requirements, one third has been allocated to graduates and two-thirds to secondary school engineers. The estimate for building is based on the expectation that a very lively technological development may be expected in this field; the engineers required will not be the same,though,as the traditional civil engineers who, in large part, are being gradually superseded by the computers which do the static calculations for them. For consulting bureaux and engineers in small-scale manufacturing, we have assumed an annual increase of 2 per cent.

For all other industries, including public services and education, we have assumed a 4 per cent annual increase in requirements, which represents approximately a doubling of requirements between 1961 and 1980. The proportions of graduates and secondary school engineers have been left at their 1961 level in these industries.

Taking into account the special demands of research we arrive finally at the overall estimates shown in Tables 33 and 34.

The required stock of graduate engineers will increase from 13,500 in 1961 to 30,000 in 1980, and that of secondary school engineers from 23,300 to 61,000. From this we derive the balance of demand and supply given in Tables 33 and 34. The present deficit of secondary school engineers, which corresponds to the large unsatisfied demand, is nearly 4,000. In the late '70's an annual output of more than 3,400 will be required, as compared with the present output of about 1,700. This estimate does not take account of emigration and of the fact that part of the output will be wasted because some secondary school engineers subsequently study for a degree. If we allow for these factors, we obtain a required annual output of 4,140 secondary school engineers in 1975/79.

Table 33

Secondary school engineers: requirements and supply-demand balance sheet

	1961	1965	1970	1975	1980
(a) Required stocks of engineers					
Manufacturing	10,000	13,515	16,575	21,184	28,185
Consulting engineers-bureaux and small business (Gewerbe)	1,362	1,475	1,598	1,802	1,952
Electricity, gas, water supply	1,347	1,550	1,850	2.200	2,620
Construction	3,554	4,494	5,994	7,834	10,207
Trade, transport, communications	3,588	8,259	10,085	12,323	15,047
Education	949				
Public administration	1,906				
Other services (including military)	595				
Total	23,301	29,293	36,102	45,343	58,011
Adjustment for research requirements	-	-	358	1,132	2,793
Total required stock	23,301	29,293	36,460	46,475	60,804

(b) Output of engineers: supply-demand balance sheet	1961-64	1965-69	1970-74	1975-79
Expansion requirements	5,992	7,167	10,015	14,329
Wastage	2,570	3,125	2,972	2,799
Total requirements:				
For new engineers	8,562	10,292	12,987	17,128
Including 10 per cent emigration	9,418	11,321	14,286	18,841
Including 10 per cent who become graduate engineers	10,360	12,453	15,714	20,725
Supply of new engineers according to 1st Assessment, Chapter II	6,450	8,340	8,330	11,000
Estimated deficit	3,910	4,113	7,384	9,725

The balance for graduate engineers is very critical throughout the period under consideration. A deficit already exists at the present time according to our calculations, and this agrees with the fact that there is unsatisfied demand at present, especially in the public administration. The required annual output would be 1,500 in the early '70's and 2,100 in the late '70's. This estimate allows for emigration, which accounts for about 16 per cent of the total wastage indicated in the table; at present emigration is probably much higher. It is evident that these requirements, which reflect, in particular, the great demand imposed by the needs of research, represent an almost insoluble problem. The stream of emigration will have to be reversed, and an immigration (or return) of engineers will have to take place. The questions of length of studies and attrition rates will also have to be very carefully considered.

We shall now compare the results with a second estimate based on the trend of engineering employment in the United States. On the basis of long-term experience in the United States (1900-1960) the employment of engineers increases by about 3.7 per cent compound per

Table 34

University graduate engineers: requirements and supply-demand balance sheet

	1961	1965	1970	1975	1980
(a) Required stocks of engineers					
Manufacturing	3,862	4,505	5,525	7,062	9,395
Consulting engineers - bureaux and small business (Gewerbe)	872	944	1,023	1,154	1,250
Electricity, gas, water supply	677	777	925	1,100	1,310
Construction	3,209	3,540	3,995	4,515	5,104
Trade, transport, communications	1,350	4,894	5,743	7,015	8,568
Education	1,190				
Public administration	2,028				
Other services (including military)	326				
Total	13,514	14,660	17,211	20,846	25,627
Adjustment for research requirements	-	-	567	1,757	4,245
Total required stock	13,514	14,660	17,778	22,603	29,872
(b) Output of engineers: supply-demand balance sheet	1961-64	1965-69	1970-74	1975-79	
Expansion requirements	1,146	3,118	4,825	7,269	
Wastage (including emigration)	1,449	2,191	2,757	3,283	
Total requirements for new engineers	2,595	5,309	7,582	10,552	
Supply of new graduates according to 1st Assessment, Chapter II	1,800	3,484	3,492	3,500	
Estimated deficit	795	1,825	4,090	7,052	

year in relation to the number of manual workers. It can be assumed that the number of American engineers as given in the population census corresponds, perhaps very roughly, to a mixture of graduate engineers and secondary school engineers as these categories are defined in Austria, because only about three-quarters of the American engineers are graduates, most of them with a rather short training, and the others are self-taught or trained in the plant. Since the long-term growth rate of 3.7 per cent is affected by the stagnation of the 1930's, and since the development has been accelerating recently, it is reasonable to take the growth rate of the 1950's, 4.16 per cent annually, as the basis for comparison. As the number of manual workers in Austria in 1980 is expected to be about the same as in 1961, we can estimate that, on the basis of this growth rate, the number of engineers in 1980 would be 2.2-fold the 1961 level, that is, 81,500. This is rather less than our estimate of 91,000. We have to consider, however, that the growth in output per man which we want to achieve, namely 4 per cent per year, is rather more than the growth rate which prevailed in the United States from 1950 to 1960 - 2.2 per cent per occupied person.

In fact, if we apply to the Austrian data the regression coefficient found on page 113 for the regression of density of engineers as a function of Gross National Product in the United States (b = 0.0013), we obtain (with an assumed annual increase of 946 Austrian

Schillings in Gross National Product per capita and a purchasing power ratio of 21.4 Austrian Schillings to the Dollar) an estimate of 111,000 engineers for 1980. The Dollar-Schilling relation, it is true, is somewhat uncertain, and a lower estimate of the number of engineers could easily be justified. Even on the lowest plausible estimate, however, we should still obtain more than 100,000 engineers. It thus appears that the earlier estimate of 90,000 is by no means excessive.

If we now resort to the third approach - for which we possess the necessary data only in manufacturing - we shall find the number of engineers needed in 1980, on the assumption that the density of engineers is then as high in each industry on the average as it is now in the best firms. The result is a requirement of over 38,000 engineers in manufacturing - slightly more than according to the first approach - if we use as a criterion the best firm; 33,000 or over 31,000 respectively, if we base ourselves on the two or the three best firms in each industry. (The criterion for selecting the best firm is the number of graduate plus secondary school engineers in proportion to total employment).

3. Graduates in management and in public administration

Management of private firms and public administration are considered under the same heading because the future demand for graduates in both cases is dominated by the shift to planning work.

The number of managers(1) and managing proprietors (which excludes craftsmen and small retailers) is given in the 1961 Census as 36,664, of whom 6,110 (16.7 per cent) were university graduates and 9,452 (25.9 per cent) had secondary school certificates. Of the 6,110 graduate managers, 1,200 were law graduates, 200 economists and political scientists, 1,900 commerce graduates, and 1,600 engineers. The remaining 1,200 were liberal arts graduates, agronomists and others.

We assume that the number of managers with university degrees will more than double by 1980, so that approximately 29 per cent of all managers will then be graduates (assuming the total number to increase to about 44,000). This is a conservative estimate; the American habit of training managers in graduate business schools is increasingly being imitated in other countries. Much more important, the shift of emphasis to work of a long-term nature, the growing role of science in industry, the scientific revolution to be expected in management as a result of the electronic computer, and the increasing demands made on managers by the international scope of their business and the speed of technical change will make it inevitable for a much greater proportion of managers to be graduates.

Of the additional 6,500 graduate managers needed (the difference, in round figures, between the present level of 6,110 and the 1980 target figure of 29 per cent of 44,000 mentioned above), about 2,000 may be engineers and scientists; about 3,500 commerce graduates; 500 economists, and 500 operational researchers, statisticians and sociologists.

In all of public administration, including semi-public bodies ("Chambers", social insurance institutes) and international organisations (for example the atomic energy authority) but excluding enterprises (post office, railways, etc.) there were, in 1961, 12,500 graduates (excluding teachers). Of these 6,400 were lawyers, 400 economists and political scientists, 600 commerce graduates, 600 agronomists, 2,000 engineers, 200 scientists and 400 medical doctors. These figures are based on the industrial classification of the

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(1) The term "manager" as used in the Census includes employees in leading positions.

Census; total employment in the public sector, as defined above, is given as 174,000 in 1961. In the Federal service (excluding enterprises) there were, in 1965, about 6,300 scheduled posts requiring graduate qualification, not counting teachers and judges. This is less than 5 per cent of total scheduled posts.

Government administration will have to undergo a thorough reform in the next decade for various reasons. The very great pressure resulting from the scarcity of labour will lead to the application of all kinds of labour-saving devices: electronic computers, storing of information by modern methods, such as micro-films, magnetic tape, modern duplication methods, etc. Furthermore, public administration will have to become imbued with scientific principles, which involve, first of all, the collecting of very much more information than has been the case heretofore and the use of scientific methods and knowledge. This will be very much easier if a computer is at hand to solve, for example, decision-making problems. Again, Government administration will have to assume new tasks which hitherto had been neglected, namely preparation and planning, as opposed to routine work.

It may seem paradoxical, but is in fact quite logical, that the reform of public administration which aims at saving on costs, and inter alia on personnel, should begin with the introduction of new highly skilled personnel. This is inevitable if one is to prepare the reorganisation necessary for introducing labour-saving methods. It is evident that the kind of training which officials require will greatly change. The prevalence of lawyers in public administration will disappear. Their place will be taken in part by economists, mathematical statisticians, operational researchers, sociologists, scientists, and engineers; the last-mentioned of these professions has already gained an important position both in management and public administration. Until recently, no university programme in economics existed in Austria (except at Innsbruck); most of the few economists employed in Austria have studied abroad for at least a year. Degree programmes in economics, statistics and sociology were instituted in 1966, and a programme in econometrics, mathematical statistics and operational research has been proposed, so far without success. The number of economists employed in public administration in other countries is larger than in Austria (in the Netherlands, a country of comparable size, there were about 840 economists working in central and local government in 1960, and in Sweden there are 500 economists in the public service) and it is on the increase in most countries, including the Federal Republic of Germany.

While a considerable saving of clerical personnel in routine jobs can be expected, the tasks which will confront public administration in coping with long-run and planning problems will vastly increase: securing of municipal water-supply, garbage disposal, sewers, measures against pollution of rivers and lakes, housing and town planning, the ever-increasing problems of transportation and communications, the administrative organisation of the increased research effort, social and psychiatric work on a scale much larger than before to deal with the increasing number of rejects and victims of our society - the catalogue of tasks is inexhaustible. One of the reasons for this is that technical and industrial progress engenders secondary problems, such as noise, pollution of air and water, nervous afflictions, delinquency, etc., which private enterprise, figuratively speaking simply dumping its waste on the public highway, fails to cope with and which have to be solved by public action. There is, further, the task of collecting more and better information. The extension of the Central Statistical Office, which is only in its initial stages, is an important part of this evolution. There are the tasks of a rational analysis of the problems of economic policy, which have only just begun to receive consideration. It is significant that, apart from certain beginnings in some ministries, the research department has not yet become an established institution in Austrian government ministries, while it is a general feature in other industrial countries. On the other side of the balance sheet is the fact that graduates are very often employed in jobs which could be satisfactorily performed by non-graduates. This will only partly offset the growth in requirements.

Taking all these factors into account, it seems reasonable to expect an increase in graduate employment in public and semi-public administration by about one half, that is by about 6,000. Some three thousand of the additional graduates should be engineers and scientists, and 500 of them agronomists. About 1,500 should be economists, 500 econometricians, mathematical statisticians, operational researchers, educationalists and sociologists, and another 500 graduates of business administration.

4. Overall graduate requirements

On the basis of the occupational distribution of total manpower anticipated for 1980, discussed in Section B1 above, we estimated that the stock of university graduates would have to be 55,000 greater than in 1961. We subsequently made detailed analyses dealing with various important fields. The individual estimates for various lines of professional training are given in the table below, which is followed by a brief explanation of the calculations for each item.

Table 35

Required increase in the stock of university graduates between 1961 and 1980

Engineers (including teachers)	16,500
Scientists (excluding teachers)	5,500
University teachers	5,000
Teachers at secondary schools(1)	13,000
Economists	2,000
Econometricians, statisticians, operational researchers	500
Sociologists, educationalists	500
Business administrators	4,000
Physicians and dentists	1,500
Agronomists	1,500
Graduates of schools of art, drama, music (with secondary school leaving certificate)	1,500
Interpreters and translators	500
Total of graduates (with secondary school leaving certificates)	52,000
Graduates of schools of art, drama, music (without secondary school leaving certificate)	1,500
Total of all university graduates	53,500

Engineers: The increase of 16,500 in the stock of engineers by 1980 is derived from Table 34 (1961 stock 13,514; 1980 estimate 29,872). Of this increase, 4,775 would be required by an expansion of engineers in research and development (1961 stock 695; 1980 estimated 5,470 -

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(1) Insofar as they have passed the special examination for secondary school teachers.

see Section C1). The other requirements for engineers include teaching, management and administration.

Scientists: The 1961 stock of 655 scientists in research would be required to expand to 5,150 in 1980, an addition of 4,495. A further addition of 1,000 has to be made to cover the requirements of production (especially in the case of chemists) and of management and administration. Teachers are not included.

University teachers: On the basis of a questionnaire sent by the Ministry of Education to the heads of University Institutes in 1965, requirements of 3,535 additional teaching staff - 642 Professors, 2,449 Assistants and 444 Lecturers (Diätendozenten) - have been reported (see Ortwin Bobleter, "Die Lage der wissenschaftlichen Forschung in Österreich", Bundesministerium für Unterricht, Vienna, 1965). From 1961 to 1965 the number of professorships and assistantships has increased by about 1,500. If this is added to the requirements cited above, a conservative estimate of total expansion needs of 5,000 from 1961 to 1980 is obtained.

Secondary school teachers: The starting point is the number of teachers having the prescribed qualifications for secondary school teaching on January 1st, 1964 (data from the Ministry of Education OECD Planning Bureau ; see Chapter V of the present report). It has been assumed that the number of teachers will grow in proportion to the number of pupils. The number of pupils has been calculated on the basis of the numbers of required secondary school leavers according to the estimates given below. To calculate the ratio of pupils to required secondary school leavers, attrition rates corresponding to past experience have been used. The calculation is shown in the following table.(1)

Strictly speaking, the number of pupils in 1980 ought to be determined by the target figure for secondary school leavers ("maturanten") for 1984. We do not have this target, and simply assume it to be the same as that for 1980. The reason for this assumption is that we do not want to state teacher requirements which it is altogether impossible to meet. It will be argued below that the targets for university graduates can only be attained if attrition in the universities declines, thus making possible correspondingly lower requirements for maturanten. This explains the decision not to put the maturanten target too high.

As a result of the above calculation, we shall need in 1980 about 12,000 more secondary school teachers than we had at the beginning of 1964. Since the number of teachers increased by a few hundred between 1961 and 1964, and since the teacher requirements at the teachers training colleges can be put at about 650, the net additional teacher requirements for the period 1961 to 1980 amount to more than 13,000. This refers to teachers who have passed the special examination qualifying them for teaching in secondary schools (Lehramtsprüfung); it does not include the graduate engineers, agronomists and business administration graduates who teach in secondary schools.

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(1) Some readers may wonder how the target for secondary school leavers can on the one hand be derived from the target for university graduates, and on the other hand, affect that very target by influencing teacher requirements. This situation is not unusual in planning; we deal with it by successive approximation.
The calculation may start from an assessment of teacher requirements based on "social demand", and take account of the feedback of graduate expansion on teacher requirements in successive stages of the calculation. If one deliberately takes an overestimate of requirements in the first stage of the calculation, one may, with luck, anticipate the feedback effect.

Table 36

Secondary school teacher target, 1980

	Teachers (with secondary school teaching examination) 1.1.1964	Secondary school pupils 1964/65	Secondary school leavers "Maturanten" target (for 1980) (1)	Ratio of pupils to "Maturanten" (1)	Pupil target for 1980	Teacher target for 1980
General secondary schools	5,673	89,582	19,804	12.20	241,609	16,015
Grammar schools mainly for future teachers	583	4,417	2,000	6.00	12,000	1,584
Technical schools .	469	12,066	4,145	9.16	37,968	1,476
Commercial schools	682	6,958	3,259	5.48	17,859	718
Secondary schools for women's occupations . . .	261	1,874	340	4.60	1,564	218
Totals	7,668	114,897	29,548		311,000	20,011

(1) The term "Maturanten" designates holders of secondary school leaving certificates which confer the right to enter higher education. This term as well as the term "Matura" - designating the certificate itself - will frequently be used for reasons of convenience in the remainder of this chapter.

The above estimate does not take into account the reduction in the pupil-teacher ratio and the introduction of the ninth year of the secondary school envisaged in the school acts of 1962.(1)

Social scientists: The estimate implies that the number of graduates in this field will double, but the composition will change considerably. Up to now there were somewhat more than 7,000, most of them graduates of the school of business administration, less than a tenth of them economists trained in the university. The additional requirements of about 7,000 include 3,000 economists, sociologists, educationalists, econometricians, statisticians and operational researchers. This altered composition takes account of the trends which have been analysed in the sections on automation and administration above.

Medical doctors and dentists: A special requirement arises in the field of dentistry. At present, in addition to the fully-fledged dentists (doctors of dentistry), there exist less fully qualified dentists who are to be replaced by doctors of dentistry as they retire from practice, in accordance with legal provisions. On the basis of the age distribution of the less qualified dentists (given in the 1961 Census), and assuming that the age-related wastage rates are the same as for medical doctors in general, it has been calculated that from 1961 to 1980 about 1,600 of the less qualified dentists - i.e. about 84 per year - will leave practice. Assuming that two less qualified dentists can be replaced by one fully-fledged dentist (with adequate assistance), this means an additional requirement of about 800 fully qualified dentists. A scarcity of dentists can be anticipated for the coming years because the number of new entrants required each year is very large - about 74 for the period 1965 to 1969 (43 to replace less qualified and 31 to replace fully qualified dentists leaving practice); this number should be contrasted with the annual replacement demand of about 300 for all medical doctors.

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(1) See Chapter I.

For medical doctors the supply position varies with the field of specialisation and the geographical area: there are many internalists and surgeons, there are many practitioners in Vienna. The scarcity of practitioners in rural areas is well known; Table 64 of Appendix IV shows the unequal distribution of doctors over the various provinces. The number of unfilled medical posts scheduled by the Health Service was 141 for general practitioners and 32 for dentists, in both cases about 3 per cent of the scheduled posts (data for early 1965).

The density of doctors in Austria is greater than in other countries, and it may be hoped that steps will be taken in the future to relieve the doctors of some of the burden of administrative duties. Nevertheless, a potential need for additional doctors exists; this need will materialise if, for example, more doctors are used in factories and schools for purposes of preventive medicine and if greater attention is given to the treatment of mental and nervous diseases. A total additional requirement of 1,500 medical doctors and dentists has therefore been assumed.

Agronomists: The requirements for agronomists result, in part, from the expansion of agricultural education. The aim is to increase the number of agricultural "Fachschulen" (agricultural schools usually giving a course comprising two winter sessions) to such an extent that eventually every independent farmer will have been trained in one of them. The teachers in these schools are either agronomists or maturanten with diplomas from agricultural secondary schools. At present most of them are, in fact, maturanten, but it would be desirable to have more university graduates for this purpose. It is also desirable to expand the number of secondary schools (at present there are four and two more are planned) in which agronomists are used as teachers. Another field of activity for which such graduates are needed is full-time rural expertise and counselling.

A large portion of agronomists today work in industry and in the administration. The supply is insufficient.

Graduates in art, music, drama, etc.: In view of the expected increase of the Gross National Product per capita over the period considered to about twice its 1961 level, an increased demand may be expected for graduates of art academies and related schools (as art restorers, actors, musicians, etc.). The extent of the need is difficult to estimate, since we do not have reliable data even on the present stock.

An expansion of about 3,000 in the number of graduates of these schools represents a plausible requirement estimate. We assume that about half of these graduates will be maturanten (this corresponds approximately to the present proportion of maturanten among the students of such schools).

We thus obtain an overall expansion requirement of 52,000 university graduates or, including the art school graduates without "matura",(1) 53,500 graduates. This figure is almost as high as the earlier global estimate of 55,000.(1) This means an expansion in the number of university graduates (excluding art academies, etc.) of about 63 per cent for the period 1961-1980 - or an annual growth rate of 2.6 per cent.

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(1) See Footnote 1 to Table 36.

Of great importance is the changed composition of the graduates according to fields of study. The traditional balance of the Austrian educated elite - there are now about 14,000 medical doctors and the same number of engineers and of law graduates, and about 8,000 qualified secondary school teachers - will be completely upset: if the targets proposed above are met, there will be in 1980, 15,000 medical doctors, 14,000 (or fewer) law graduates, 30,000 engineers, 20,000 qualified secondary school teachers, and - among the major groups - 15,000 social scientists. In certain fields - e.g. pharmacy and veterinary surgery, perhaps also law - there exists a downward trend. This decline has not been taken into account explicitly but it represents a kind of "implicit reserve", which offsets the fact that most of the requirements have been estimated on the low side. Even more important are the changes within the various groups, which will not be examined here in detail. The special incidence in the medical field of the requirements for dentists has been stressed. Considerable changes in the composition of the engineering profession will take place (in favour of electrical engineers and at the expense of civil engineers). In the social sciences the weight is being shifted to fields of study which are new for Austria.

The growth in university graduate requirements has been distributed over the entire period according to the following principles: for the period 1961-64 we have taken account of the fact that the number of scheduled posts for secondary school and university teachers has increased. Taking account, further, of the requirements for engineers, we assume a growth of total demand by 4,000 for this period. For the period 1965 to 1980, we assume an exponential growth of requirements. Confronting expansion requirements plus wastage with the estimated supply of newly graduated people we obtain the following balance.

Table 37

University graduate manpower - overall supply and demand balance sheet, 1961-1980

	1961-64	1965-69	1970-74	1975-79
Expansion requirements	4,000	13,500	16,000	18,500
Wastage	8,066	11,519	12,804	14,044
Total requirements	12,066	25,019	28,804	32,544
(requirements per year	3,016	5,004	5,761	6,509)
Estimated supply of new graduates according to 1st Assessment, Chapter II	9,668	17,629	19,213	20,000
Estimated deficit	2,398	7,390	9,591	12,544

Note: The wastage includes an allowance for emigration (see Appendix II in the Annex to this Chapter).

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(1) See Section B1 above.

The comparison of expected demand and supply reveals substantial deficits. In fact, according to this balance sheet we already have a deficit of about two-and-a-half thousand graduates at the present time. Of course, there may be hidden sources of supply which we have not considered in the above calculation. We have assumed that at the beginning of the period, in 1961, supply and demand for graduates was balanced. But there was still a certain amount of mis-used graduate labour, and this may have been greater than the unsatisfied demand in other directions. Part of the graduates are still in jobs for which graduate qualifications are not needed. For various reasons (often because they have lost their skills and perhaps are not sufficiently well qualified), these graduates cannot be shifted to qualified work. To the extent to which they retire or die without being replaced by new similarly employed graduates, they represent a source of supply: wastage of non-essential graduate labour, which has to be deducted from the wastage in the above table. It is difficult to believe, however, that this type of manpower represents more than 10-15 per cent of graduate employment, and the deficit could not be reduced on that account by more than about 2,000 in each five-year period, even if we assume that the graduates concerned are more likely to be older people and therefore more likely to retire. A large part of the deficit remains, therefore, even after allowing for wastage which need not be covered.

In the period 1975/80 a university graduate output of 6,500 will be required for expansion and to cover wastage.

If the large deficits arising in the intervening period cannot be covered by special measures, such as a reduction of attrition by a reform of teaching methods, curricula etc., the output of graduates in the late '70's might have to be increased to beyond the number given in the table, perhaps to 7,000 or 8,000, in order to satisfy the pent-up demand for graduates.

D. Projection of Requirements for Secondary School Graduates ("Maturanten")(1)

From the requirements for university graduates, part of the demand for maturanten can be derived. Since the average age of university graduates is 24½ (excluding those who graduate after the age of 30), and the "matura" (school-leaving) certificate is acquired at 18½ years of age in most cases, we shall assume a lag of 6 years between "matura" and university graduation. We assume, moreover, that attrition in the course of university study is 50 per cent on the average. On this basis we have estimated the annual number of required university entrants in 1965-69 at 11,800, in 1970-74 at 14,000 and in 1975-79 at 21,200. (To make this calculation we had, in fact, to make assumptions about the expansion of university graduate requirements in the 1980's. We assumed that the stock of graduates after 1980 will increase by 4 per cent per annum compound. The number of graduates per year this implies is nearly 9,000 in 1980-84 and 17,000 in 1985-89, but the last figure has little influence on our calculations for the maturanten required in 1975-79).

To this have to be added the numbers of maturanten who have acquired a vocational training and are needed for entry into economic life, and also the numbers to be trained as teachers in the teachers training colleges. The total of these requirements is given in Table 39 below.

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(1) As already defined earlier, "Maturanten" are those who receive secondary school leaving certificates entitling them to enter higher education.

Table 38

Numbers of "Maturanten" required for entry to the labour market

	1961-64	1965-69	1970-74	1975-79
Secondary school engineers	8,562	10,292	12,987	17,128
Plus assumed 10 per cent for emigration	856	1,029	1,299	1,713
Total secondary school engineers	9,418	11,321	14,286	18,841
Business academy graduates	7,122	10,010	12,685	15,372
Graduates of secondary schools for women's occupations	-	1,200	1,500	1,700
Graduates of agriculture schools	920	1,500	2,500	2,500
Totals	17,460	24,031	30,971	38,413
Per annum . . . , ...	4,365	4,806	6,194	7,683

Table 39

Total requirements of "Maturanten" per annum

	1965-1969	1970-1974	1975-1979
New entrants to universities	11,820	14,008	21,172
Entry to the labour market by engineers, business academy graduates, etc.	4,806	6,194	7,683
Entry to teacher training colleges (1)	3,000	1,875	2,000
Totals per annum , ...	19,626	22,077	30,855

(1) Up to 1967, and, in part, up to 1969, these figures refer to graduates of the old-type of secondary-level teacher training schools. See Chapter I, Section A4, regarding reorganisation of teacher training in Austria. The requirements for general compulsory school teachers are assumed to be 2,400, 1,500 and 1,600 for the three periods respectively (see Chapter V of this report). The attrition in the teacher training colleges has been assumed to be 25 per cent.

Ideally, the requirements for secondary school graduates could be met by training all future university entrants in the general schools, those required for active participation in the economy in the relevant types of vocational school, and the future entrants to teacher training colleges in the grammar schools for future teachers.

This would correspond to the purposes of these schools, but in practice things do not work out so smoothly. Inevitably a number of those who leave the vocational schools go on to higher studies, those from the business academies to the university-level School of Commerce and those from the technical school to the School of Technology. A major reason for this is that parents of lower-class children do not easily decide to send their child to a general secondary school at the age of 10, and thus far there has been practically no opportunity for a child to switch over from the upper primary to the general secondary school at the age of 14. (The school law of 1962 aims at effecting a change in this respect.)

Consequently, practically the only way to the "matura" open to children with a background unfavourable to education is the vocational school. These children feel they are running no risk in the vocational school because they will either leave after two years (to be skilled workers at the intermediate technical school level) of they will go on to the matura, and if their financial situation permits, they may then decide to continue their studies, or else will enter the labour market with a vocational qualification. The disadvantage of this arrangement is that the students concerned will miss the wider opportunities for general education which, in the nature of things, the general secondary school could offer them.

On the other hand, the preference of working-class children for a vocational type of education (whether this is offered in the form of a stream in a comprehensive school or, as now, in a separate school) is very strong, not only for the reasons mentioned but also because these children seem to feel completely lost in an education which, as it appears to them, has no relation to practical life. Since the spirit, content, and form of education in the general secondary schools are, in a sense, alien to the working-class child, the child is likely to fail in these schools for reasons other than lack of ability, and the attempt to broaden social participation in secondary education may prove unsuccessful if it relies on the general secondary school in its traditional form. The experience of other countries (presented, for France, by Vermot-Gauchy: "L'Education Nationale dans la France de Demain") should lead us to consider seriously whether some kind of secondary vocational education is not, in practice, the path to higher education suitable to working-class children.

If this view is accepted it would mean that vocational (especially technical) education would have to be expanded greatly in excess of the direct need for the skilled personnel graduated from these schools, while the general secondary schools would need to be expanded to a lesser extent than the inflow to the universities. We should, in this case, save some of the overall increase in maturanten, because the failures of the universities, if they come from vocational secondary education, go back to the pool of secondary school engineers and business academy graduates, whereas the failures of those without vocational training are lost from the point of view of our calculation of requirements.

An alternative - or perhaps a complementary - policy would be to reform the general secondary school in such a way as to establish that connection with practical life which is found wanting by the working-class child, and also to include certain elements of a general vocational education (not aimed at preparing for any particular career). Such a reform would be based on the consideration that the working-class child's implied criticism of the general secondary school merits attention from a more general point of view - in other words, that a reform aimed at meeting this criticism would benefit, not only the working-class child, but the other children as well.

While these problems are presented here for serious consideration, we shall assume that the ratio of vocational school leavers who go to universities will not substantially change. We may roughly estimate that about 20 per cent of those leaving business academies and technical schools will continue their studies. Since 70 per cent and (probably) 50 per cent of these groups, respectively, drop out in the course of their university studies, and therefore enter the labour market without university degrees, we have to increase the scheduled output of the business academies by 6 per cent and that of the technical schools by 10 per cent.

On the other hand, the number leaving general secondary schools may be reduced by the whole of the 20 per cent of the vocational school leavers who continue their studies. This pre-supposes that all general secondary school leavers will continue their studies and all teacher training college students will come from the grammar schools mainly for future teachers; this will not be strictly true but can be assumed as an approximation. We then obtain an estimate of the required output of the different types of schools, which is given in the table below.

Table 40

Requirements for "Maturanten" according to school type

	1965-68	1970-74	1975-79
Technical schools	12,453	15,714	20,725
Business academies	10,610	13,447	16,296
Schools for women's occupations	1,200	1,500	1,700
Agriculture schools	1,500	2,500	2,500
All vocational schools	25,763	33,161	41,221
All vocational schools per annum	5,153	6,632	8,244
General secondary schools, per annum	10,966	12,928	19,804
Grammar schools mainly for future teachers, per annum	3,000	1,875	2,000
All maturanten per annum	19,119	21,435	30,048

In calculating the numbers of required maturanten by school type, it is assumed that 20 per cent of the graduates of business academies and technical schools will go on to higher studies. The output of these schools has therefore to be increased to include the anticipated university entrants and that of general secondary schools reduced correspondingly.

Since maturanten from vocational schools who do not finish their university studies re-enter the pool of secondary school engineers, etc., in contrast to those from general secondary schools, who are lost from the point of view of our skilled manpower estimates, we obtain a calculated saving of maturanten to the extent to which university entrants come from vocational schools. For this reason the sum of requirements by school type in Table 40 is smaller than in Table 39, which summarises requirements according to the destination of the graduates (university, labour market, etc.), but not according to the type of secondary school from which they come.

As we can see from the table, of the 21,400 maturanten per year required in 1970-74, 13,000 will have to come from general secondary school. These will constitute the bulk of the entrants to universities who will graduate in the late '70's. But the pupils who will pass their certificate examination (matura) in the early 1970's are already in the lower forms of the general secondary schools. Since the transition from upper primary school (and, a fortiori, from ordinary primary school) to a general secondary school in present conditions is of no practical importance, the number of maturanten in the early 1970's is pre-judged to a large extent by the number of pupils who entered the general secondary school in recent years: there were, in fact, 14,393 of them in 1964, while, as we have seen, 13,000 maturanten from these schools are required, as an annual average, between 1970 and 1974, and the attrition is 50 per cent.

This illustrates the difficulty of adjusting the educational system to an economic target, a difficulty which stems from the rigidity of the system and the length of the gestation period. This difficulty is acutely felt when, as is the case in Austria, expansion has to be effected fairly rapidly after a period of stagnation.

Demographic factors also play a role. As a result of the size of the different age groups, the evolution of university graduate output will take approximately the following course: in the late 1960's output will rise above replacement level and some expansion will occur (this will have a stimulating effect on the demand for university graduates, because of the new spirit introduced by the new men). In the early '70's, university graduate output will be low in comparison to requirements, and very little can be done about it now. In the late '70's, the demographic factor will still be unfavourable, but we have a greater possibility of influencing the situation. The demographic factor will become favourable in the 1980's, and it will be easy to obtain graduates then, but can we wait that long?

In order to remedy the shortage of university graduates in the 1970's, which will be the most difficult period, we have to envisage an emergency programme, at both the secondary and higher educational levels, to overcome the rigidities mentioned above. To this end we should:

1. Encourage the transition of able pupils from upper primary to general secondary schools at the age of 14;
2. Reduce attrition in the secondary schools;
3. Reduce attrition in universities;
4. Reduce the length of study.

These are formidable tasks. They imply a stepped-up construction of secondary schools and special measures to select able pupils in the elementary schools and induce their parents to send them to a secondary school. They imply reforms in university teaching methods and curricula insofar as these are among the factors responsible for the length of studies and the number of students - by no means all unintelligent - who drop out. They imply, finally, reforms in the teaching methods of secondary schools, and this requires training not only more, but also more interested and broad-minded teachers, who will not bar the way to new methods and attitudes.

To illustrate the decisive importance of such reforms for the solution of our problems, we shall demonstrate the effects that would result from a given reduction in attrition. Let us assume that attrition in universities is reduced to 33.3 per cent (compared with the 50 per cent assumed above). The required number of entrants to universities would change in the following manner:

Table 41

Required number of entrants to universities per annum

	1965-69	1970-74	1975-79
Assuming 50% attrition	11,820	14,008	21,172
Assuming 33.3% attrition	8,865	10,506	16,877

We would need only 10,500 entrants annually in the period 1970-74 if university attrition were reduced to 33.3 per cent. As mentioned above, there were 14,400 pupils in the first form of general secondary schools in 1964. With 50 per cent attrition in these schools we should get 7,200 maturanten annually in the early '70's. It would appear feasible to recruit the remaining 3,300 maturanten required as entrants to universities from the vocational schools, provided enough of these schools are built. (According to the assumptions made above, about a thousand vocational school leavers will enter universities annually in the period 1970-74).

If attrition in secondary schools is also reduced, the target would be even less difficult to reach. The whole problem of requirements suddenly appears reduced to manageable proportions if reduced attrition is assumed. Such a drastic reduction in attrition would, of course, presuppose educational reforms of a highly creative character.

B. Projection of Requirements for Skilled Manual Workers(1)

An uncritical extrapolation of 1951-1961 trends would be even more misleading in estimating requirements for skilled workers than in the case of engineers: not only did the situation, in this case too, change from relative abundance to great scarcity, but the phase of mechanisation which Austrian industry has undergone in the last 15 years, and the characteristic displacement of skilled workers which goes with it, are temporary and will be followed by a new phase marked by a technology of a different character.

A downward trend in the proportion of skilled workers has dominated in Austrian manufacturing over the last 15 years (see Appendix IV, Table 72). The mechanisation of the production process in steel mills, rolling mills, paper mills, the textile industry, etc., has eliminated the skilled worker on the production line and replaced him by semi-skilled workers having undergone a short period of training: steel and rolling mill workers, paper makers, weavers, shoemakers, etc., have lost their place as craftsmen in manufacturing. Only the industries which work to order in small lots have escaped this process: in the engineering industry skilled craftsmen still account for one-half of the work force.

The effects of mechanisation on the employment of the traditional types of craftsmen in manufacturing have not yet worked themselves out completely. Some of the craftsmen are still retained, in some cases owing to collective bargaining agreements which stipulate their retention for jobs which could be performed by semi-skilled workers (for example in bakeries), in other cases because firms want to have a reserve from which they can recruit foremen. The requirements for foremen have, if anything, increased with respect both to numbers and to qualifications.

On the other hand, the opposite phenomenon, consisting of a new demand for other types of skilled workers, has not worked itself out completely either, because of the manpower shortages in these skills. This new demand arises from the increasing role of maintenance and repair in mechanised plants. The proportion of total manpower engaged in maintenance and repair increases strongly with mechanisation, and even more sharply with automation, because the equipment becomes more complicated and demands increasingly skilled attention. Most of those engaged in repair and maintenance are skilled workers, and a very high level of skill is often required. The occupations of fitter, electrician and mechanic, which account for a large share of the repair and maintenance jobs, tend to divide and specialise, and the qualifications required for some of these jobs have risen to a very high level.

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(1) This paragraph deals almost exclusively with manual workers and the brief term "skilled workers" is meant to apply to manual skilled workers.

In this field there has emerged a comparatively new occupational group, a kind of technician situated midway between the traditional skilled worker of former times and the secondary school engineer; this new type of technician has to be skillful with his hands, but at the same time he has to possess fairly advanced technical knowledge. Whether these people will have the status of salaried employees or of skilled workers is irrelevant for the present purposes. We continue to classify them as skilled manual workers here.

The character of the phase of technical development which is now imminent can be briefly sketched as follows: while the mechanisation of the last 15 years has eliminated the skilled worker on the production line in mass-producing industries, the automation or part-automation which will follow will eliminate a large share of the semi-skilled workers who have taken his place; what remains in a dominant position is the skilled worker in repair and maintenance jobs. Moreover, there are other trends favouring the skilled worker, which will only gradually assert themselves: for example, the machine tenders will increasingly be skilled men who must have an advanced knowledge of the equipment they are tending because of the great cost of stoppages of automatic or semi-automatic machinery. For the same reason, the operators of cranes and other machines which continue to be under human control will receive very thorough training. There will be new types and combinations of skills, arising, for example, from the mechanisation of processes in food manufacture, while the building trade will increasingly dispense with common labour and develop new skill requirements in addition to the old ones which remain important and are at present in very short supply. At the same time, the importance of skill in engineering will continue.

It is not easy to evaluate the prospects of the skilled workers in Austria in statistical terms, because we have no very accurate idea of how many of them there are. According to the Business Census of 1954, there were at that time 352,000 skilled workers (excluding independent craftsmen), or 39 per cent of all manual workers covered by that Census. If we apply the same ratio to the number of manual workers in the Population Census of 1961 we obtain an estimate of 740,000 skilled workers (including self-employed master-craftsmen) for 1961. We obtain a very similar figure by adding up, from the 1961 Census, all the occupations which are legally regarded as skilled.

This estimate includes three categories of workers:

1. Those who have been apprentices and have passed their journeyman's examination;
2. Those who have passed no examination, and in many cases have had no apprentice training, but have been upgraded in the plant on the basis of long experience on the job. Their number must be considerable;
3. Those who are not skilled workers at all, but are semi-skilled persons doing work which used to be skilled, for example, weavers. The semi-skilled cannot be separated from the skilled in these occupations, because they are not differentiated in the Census.

The estimate is thus too high, insofar as it includes the semi-skilled noted in point 3, although it does not include, on the other hand, a number of occupations which are skilled in fact but not recognised as such by the Trades Law (for example, welders, crane drivers, various types of chemical workers).

The number of skilled workers, according to the above (inadequate) count, was about the same in 1951 as in 1961. During that decade, about 25,000 apprentices per year passed their journeymen's examination, and in addition 2,000 per year left the intermediate level technical schools (Fachschulen). At a calculated wastage rate of 5.5 per cent per annum there may have been some 490,000 skilled manual workers with journeymen's examination or intermediate technical school diploma in 1961. This total might have been distributed as follows:

Table 42

Stock of skilled manual workers(1)

(a) Estimated distribution of skilled manual workers, 1961

	(in thousands)
Manufacturing	163.8
Trades (excluding building and services)	190.2
Building	68.8
Transport and communications	26.3
All other (public utilities, government, services)	40.9
Total	490.0

(b) Distribution between manufacturing and trades alone

	Absolute in thousands	Percentages
Manufacturing	163.8	46
Trades (excluding building and services)	190.2	54
Total	354.0	100

With the exception of manufacturing, these figures have to be regarded as informed guesses. They show that the trades, including the building trade, account for about 55 per cent of all skilled manual workers. On the other hand, the overwhelming majority of all apprentices, i.e. 80 per cent (excluding commercial apprentices), are trained in the trades, and only 20 per cent in manufacturing. This illustrates the fact that the trades are doing the training of skilled workers for manufacturing and for the rest of the economy. This traditional system has not changed substantially in the last fifteen years, although the share of manufacturing in the total number of apprentices has gone up from 15 per cent in 1951 to 20 per cent in 1963; it is based on the need of the trades for helpers to assist the craftsmen. Up to now this has created a sufficient supply of craftsmen to make it seem superfluous for industry to step up its training to a large extent.

But satisfactory as it was, the system cannot satisfy all the requirements now. The experience which an apprentice gets in the trades is in many cases inadequate for the needs of modern automated industry because he cannot work on the equipment which will ultimately require his skill, and because he cannot spend sufficient time on his training proper. Therefore, more apprentices will have to be trained in manufacturing industry training centres.

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(1) The figures for trades, building, and transport and communications have been placed at the same level as in the 1954 Census, and "all other" have been derived as a residual.

Even that training will not be sufficient in some cases. As already mentioned, some of the new jobs arising from the development of modern automated plants demand a great deal of knowledge which can best be acquired in a school. Moreover, it is desirable that these specialists have sufficiently wide experience and flexibility, and are not limited to the special needs of one firm, as they inevitably will be if they are trained in industry. These highly skilled workers - or technicians as they were referred to above - will play a decisive role in the development of automated industry, and shortages in these categories represent a potentially dangerous bottleneck. Such specialists should be trained in intermediate technical schools.

An estimate of the requirements for skilled workers has been made on the basis of the above analysis of the problem. For manufacturing, an "elasticity" of 0.5 in the requirements for skilled men with respect to output has been assumed (as compared with the elasticity of 0.75 for the requirements for engineers, given above). The change in the future composition of manufacturing industry has been taken into account in the same way as in the calculation of engineer's requirements. We obtain for manufacturing a required stock of 207,000 skilled workers in 1975 and 247,000 in 1980. This is an expansion of about 90,000 during the period 1965-1980. If we add about 50,000 for building and related trades, and 10,000 for net expansion (taking account, that is, of the shrinkage in some occupations like carpentry, tailoring) of the other trades and of transport and communications, we get total expansion requirements of the order of 150,000 for 1965-1980, that is 10,000 a year on the average.

Since the replacement demand is 27,000, we obtain yearly requirements of 37,000 in apprenticeship and intermediate technical school output combined.

The required output of skilled manual workers is shown in Table 43.

Table 43

Required output of skilled manual workers per year

	1965-69	1970-74	1975-79
Replacement	27,000	27,000	27,000
Expansion	5,000	10,000	15,000
Total requirements	32,000	37,000	42,000
of which:			
Intermediate technical school graduates	3,400	4,400	7,500
Journeymen completing apprenticeship	28,600	32,600	34,500
Expected annual output of journeymen according to Chapter II, 1st Assessment	25,092	29,710	34,500(1)

(1) 1975 and 1976 only.

If the supply of apprentices permits, we might also train replacements for those skilled workers who have not passed an apprenticeship examination. This will hardly be possible within the next ten years. At present the demand for apprentices is much greater than the supply.

The number of youngsters in their first year of apprenticeship in 1963 was about 50,000, of whom approximately 35,000 were in manufacturing and trades (the rest in commerce, tourism and transport). This represented about 50 per cent of all 15-year-olds - 64 per cent of the boys and 36 per cent of the girls. This ratio would seem to represent a limit in present conditions (and it may even have to decline when school participation increases further): at present there is practically no urban reserve of primary school leavers who, failing to continue their studies, have not taken up an apprenticeship. The new supply of unskilled and semi-skilled workers comes mainly from young people leaving agriculture who move into towns, and from those who do not finish apprenticeship training or fail in their journeyman's examination: on the average, 15 per cent fail, and total drop-out is perhaps 20 per cent.

The outlook for covering the requirements estimated above is not good in view of the demographic situation in the next decade. With 37,500 entrants into apprenticeship in 1963 (including tourist trades but excluding commerce), we may expect an output of perhaps 31,000 in 1966, to which has to be added an intermediate technical school output of 2,500. In the late '60's, however, the output will fall owing to smaller numbers of 17-year-olds and the dropping-out of an entire cohort of 17-year-olds in 1969 (owing to the extension of compulsory schooling). The inflow of young people into apprenticeship and intermediate technical schools will, however, increase in the early '70's by perhaps 5,000, and by another 5,000 in the later '70's, so that we shall have 45,000 entrants annually in the period 1970-74 and 50,000 in 1975-79.

How many of these should be trained in technical and trades schools? Cogent reasons have already been given above for a large expansion of this type of training. The intermediate school technician has a position midway between the secondary school engineers, of whom about three times more will be trained in the late '70's than at the present time, and the traditional skilled worker. Of the present annual output of 2,400, about a thousand graduate in the metal trades and in plastics, and this portion ought to be increased to a greater degree than the training of engineers, while the output in the textile and clothing occupations need not be increased much. The required annual output of the intermediate technical schools may be put at 7,500 in the period 1974-79, three times as much as now.

Requirements for graduates of all types of intermediate vocational school are projected in the following table.

Table 44

Requirements for graduates of the intermediate vocational schools

	1965-69	1970-74	1975-79
Technical schools	3,400	4,400	7,500
Business schools	4,500	5,000	6,000
Schools for women's occupations and for social work	3,000	4,000	4,000
Total	10,900	13,400	17,500

If 47,500 young people annually enter training as manual workers in the middle of the '70's, and 7,500 of these are trained in intermediate technical schools, that will leave at most 40,000 entering apprenticeship training (and correspondingly), the compulsory part-time vocational schools for apprentices), of whom perhaps 32,000 will finish as journeymen. An output of this magnitude has in fact already been reached in the past (1959) and is also foreseen in the supply estimates (Chapter II). The extent of apprentice training and the capacity of the compulsory part-time vocational schools need therefore hardly be increased, since most of the additional recruits are preferably taken care of by the intermediate technical schools. The proportion of skilled workers trained in these schools will, however, remain below 20 per cent.

The great difficulty of finding a sufficient number of apprentices to meet the urgent requirements points to the need for training and (retraining) of adults. This, in view of the rapidity of technological change and the difficult supply position, will be a very urgent task.

F. Distribution of: (1) Occupations Entered by School Leavers; and (2) Educational Output by Type and Level of Training

An attempt is made here to show how the stream of youngsters leaving school is divided over various occupational fields; this division is then confronted with the division of "educational output" according to types and levels of training (to avoid confusion, it should be noted that the stream of young people entering employment for the first time includes those entering apprenticeship; the stream is therefore considered at the point where full-time education ends, although part-time education, in the compulsory vocational schools, may still continue).

We start from the projection of occupational distribution in Appendix IV, Table 55 (see Section B1 above) and derive from it the yearly expansion of the labour force in various occupations:

Table 45

Projected annual changes in labour force strength by occupational group

(all figures denote increases unless preceded by minus sign)

(in thousands)

	1951-60	1961-64	1965-69	1970-74	1975-79
Technical and professional workers	3.0	6.9	6.7	8.8	13.5
Managers and officials	0.6	0.9	0.4	0.8	1.6
Sales workers	6.8	3.5	2.2	3.3	6.8
Office workers	9.0	4.8	3.0	4.6	8.4
Farmers and agricultural workers	-31.7	-22.7	-22.4	-22.0	-22.2
Manual workers in production and transport .	9.2	1.7	- 4.1	- 0.5	8.7
Service workers	5.8	4.5	3.0	5.0	9.8
Net annual expansion (or contraction) . . .	2.7	- 0.4	-11.2	0.0	26.6

This illustrates the effects of the basic demographic situation: the scarcity of manpower in the late '60's and its relative abundance in the late '70's.

We now have to add the replacement demand to the expansion demand for the various occupations. For total manpower, the two should add up to the inflow of young people which is given by the demographic data. We first consider this total inflow, as shown in the following table for three age groups.

Table 46

Inflow of young people to the labour market for selected age groups

	Average annual number of 15-, 18-and 25-year-olds entering (or expected to enter labour market)			
	15-year-olds	18-year-olds	25-year-olds	Weighted average
1951-1960				
Absolute numbers (in thousands)	105.1	101.1	93.9	103.9
Percentage distribution by age group. .	80%	17%	3%	100%
1961-1964				
Absolute numbers (in thousands)	101.8	98.5	89.6	100.6
Percentage distribution by age group. .	75%	20%	5%	100%
1965-1969				
Absolute numbers (in thousands)	95.6	101.5	116.9	98.1
Percentage distribution by age group. .	70%	25%	5%	100%
1970-1974				
Absolute numbers (in thousands)	109.9	98.5	98.5	105.9
Percentage distribution by age group. .	65%	25%	10%	100%
1975-1979				
Absolute numbers (in thousands)	125.4	116.8	94.5	119.7
Percentage distribution by age group. .	60%	30%	10%	100%

This table illustrates basic demographic trends which have already been referred to. The number of 15-, 18-and 25-year-olds have been weighted according to the proportions in which these age groups are expected to participate among the entrants into the labour market, and an average yearly inflow is thus obtained. From this we deduct 3 per cent as a rough estimate of unemployables. Then the projected expansion (see Table 46 above) is deducted, and the remainder represents the replacement demand. After deducting an estimate of the replacement demand in agriculture, the remaining replacement demand is allocated among the various occupations in proportion to their respective total manpower strengths.

Table 47

Replacement demand by occupational group

(in thousands)

	1951-60	1961-64	1965-69	1970-74	1975-79
Technical and professional workers	4.5	5.6	7.2	8.0	7.4
Managers and officials	1.7	2.0	2.3	2.3	1.9
Sales workers	4.5	5.9	7.1	7.2	6.1
Office workers	5.3	7.1	8.5	8.8	7.5
Farmers and agricultural workers	45.8	35.6	33.6	30.0	29.3
Manual workers	29.5	33.4	37.7	36.2	28.6
Service workers	6.8	8.3	9.9	10.1	9.7
Total	98.1	97.9	106.3	102.6	90.5
Percentage of wastage assumed: in agriculture	5.0	5.0	5.5	6.0	7.5
For the rest	2.21	2.41	2.74	2.65	2.07

The overall wastage rate which is given in the above table results simply from our assumptions concerning the increase in total manpower and concerning the flow of new young entrants to the labour force. This wastage rate is smaller than that calculated according to "method B" from the social security data (see Appendix II) which amounts to an average of 3.56 per cent, over the period 1961/62-1964/65, for male and female workers and salaried personnel. That estimate, however, is inflated by early pensioning in those years and by the entries into permanent government service. Moreover, the lower wastage rates in the table above apply to total manpower including self-employed people, who have a lower wastage rate than salaried employees. The wastage according to "method A" (wastage through death, incapacity or old age) was 2.5 per cent in 1961.

By adding the expansion and replacement demand as derived above, we finally obtain an estimate of the stream of young recruits into various occupations.

These figures are necessarily somewhat speculative because we have no solid basis for estimating replacement demand. In particular, we have no data on the extent of the shifts of adults between various occupations.

The occupational distribution of the young entrants to the labour market can now be confronted with their distribution according to schooling.

We can combine the various types of educational output into broad groups which roughly correspond to the occupational groups.

Table 48

Annual stream of young entrants to the labour market

(in thousands)

	1951-60	1961-64	1965-69	1970-74	1975-79
Technical and professional workers	7.6	12.5	13.9	16.8	20.9
Managers and officials	2.3	2.8	2.7	3.1	3.5
Sales workers	11.3	9.5	9.3	10.5	12.9
Office workers	14.3	11.9	11.5	13.3	15.9
Farmers and agricultural workers	14.1	13.0	11.3	8.1	7.1
Manual workers in production and transport . .	38.6	35.0	33.6	35.7	37.3
Service workers	12.6	12.8	12.9	15.2	18.4
Totals	100.8	97.5	95.2	102.7	116.0

Table 49

Educational output divided into occupationally relevant categories (per annum)

(1961-64 supply, 1965-79 requirements)

	1961-64	1965-69	1970-74	1975-79
University graduates(1)	2,110	4,770	5,250	5,990
Secondary school engineers(2)	1,450	2,060	2,600	3,420
Teachers	880	2,400	1,500	1,600
Agricultural (secondary schools)	220	300	500	500
Women's occupations (secondary schools)	280	240	300	340
I. Total of graduates etc.	4,940	9,770	10,150	11,850
Commercial schools:				
Secondary	1,360	2,000	2,540	3,070
Intermediate	4,130	4,500	5,000	6,000
II. Total commercial	5,490	6,500	7,540	9,070
III. Maturanten [without vocational training(3)] . . .	3,380	4,490	5,970	8,180
IV. Commercial apprentices(4)	12,000	12,000	14,500	17,000
Technical schools	2,400	3,400	4,400	7,500
Industrial apprentices	37,500	35,000	40,500	42,500
V. Total of skilled workers	39,900	38,400	44,900	50,000
VI. Schools for women's occupations	2,600	3,000	4,000	4,000

(1) Exclusive of an allowance for emigration - (for 1961-69: 15 per cent of total wastage; for 1970-79: all wastage on new accruals since 1961 counted as emigration (see Appendix II). Including graduates of Art Academies, etc.

(2) Exclusive of 10 per cent emigration.

(3) Corresponds to attrition at universities. A lag of 2½ years between matura and entry into labour market is assumed.

(4) Inflow into apprenticeship. The output is 20 to 25 per cent less and comes 3 years later.

In the above table, Group I (graduates, etc.) corresponds on the whole to the occupational group "technical and professional workers", which, however, also recruits people from other schools. The commercial apprentices (Group IV, correspond mainly to the sales workers, but also in part to the office workers. The commercial schools (Group II) train office workers. The maturanten without professional training (Group III) will divide between the technical and professional group and the office workers. Their large number makes it clear that attrition in universities, referred to above, threatens to become a serious problem. The intermediate technical schools and industrial apprentices (Group V) finally correspond to the group of manual and service workers. The schools for women's occupations also train service workers insofar as they do not limit themselves exclusively to preparing girls for domestic duties.

If the technical and professional personnel, the managers and officials, and the office and sales workers are combined, the inflow during the period 1975-79 will amount to 53,200 annually. On the other hand, the number trained in Groups I to III, together with the inflow into commercial apprenticeship, amounts to 46,100. (About 20 per cent of the commercial apprentices, however, fail in their examination). This shows that a high proportion of non-manual labour will receive schooling beyond the compulsory school age or training as apprentices if education is expanded to the levels assumed above.

G. Concluding Remarks

Educational planning and the forecasting of manpower requirements are new in Austria. The present study is only the beginning of a development which is certain to continue unabated: manpower forecasting has become a permanent exigency of economic policy. The task is to improve the forecasts and to revise them continually.

The need for improvement applies, not least of all, to the approach which is at the basis of educational planning today: requirements are estimated, they are confronted with anticipated supplies, and the result is used as a basis for policy decisions.

The gap between the manpower target and the stream of educational output, determined by the given conditions, is not bridged by a systematic analysis which shows what the possibilities of adjustment are and what limits to the feasible policy exist. There are hardly any sufficiently realistic and practically useful models which show in what way the feasible policy is constrained by given initial conditions - the number of teachers, of young people of various ages etc. and what alternative policies are open at what cost.

The problem, however, is really that we start with a limited amount of skilled manpower and have to distribute it between a) production, b) research and development, and c) education and training. The expansion of the skilled manpower at our disposal requires time, and time, and demands that we shift a certain amount of manpower to teaching; and this means that we are obliged, to a corresponding degree to neglect the short-term interests of production and the medium-term interests of research and development.

Again, there is the problem of how to distribute over the economy as a whole funds for investment, understood in a broad sense, between a) investment in material goods (plant and equipment), b) expenditure for research and development and c) expenditures for education and training.

These questions have not thus far been directly dealt with in a way which can lead to useful practical results. The perceptive reader will understand, however, that one cannot wait for an improved model of educational planning if one is faced with the problems of Austrian educational policy. The reader will similarly have understood that manpower requirements cannot be measured on a jeweller's scale; the important thing is to estimate the broad trends. The significant advance which educational planning represents is the assurance that in the future decisions on educational policy will be based on quantitative data.

Chapter IV

THE SOCIAL DEMAND FOR EDUCATION[1]
1966-1975

Introduction

A problem facing educational planners, is to find reliable ways of estimating the number of pupils who will be or ought to be enrolled in the various types of schools and institutions at a future point in time. From the purely technical viewpoint the problem of estimating numbers in full-time compulsory schooling is relatively straightforward: its solution lies in the derivation of survival estimates of known birth groups based upon assumptions about the continuation of the existing school structure. One unknown in these calculations is the future of the birth rate itself. If entrants to primary education are required for a future period of more than five years (the actual length depending upon the age of school entry), then assumptions must be made about the future of the birth rate.

More difficult, however, is the estimation of voluntary enrolments of pupils above the compulsory school age. Over the past years two main techniques, or approaches, have been used in making such estimates. These are known for convenience as the "manpower needs" approach and the "social demand" method - the latter of which will concern us in this chapter. Chapter 3 by Dr. Steindl is an example of the use of one kind of manpower approach. Based upon a qualitative assessment of the past and future development of the Austrian economy, it outlines the manpower needs over the next 10 years. From such manpower estimates educational enrolment and output targets can be derived. These estimates tell the planners what the system must produce if economic needs are to be met.

The social demand approach has a different starting point. It uses past experience of educational enrolment to detect the trends of pupil enrolments and outputs (both overall enrolments and by type of school) and projects these into the future. The targets which result from such analyses indicate the number of places that will have to be made available if the demands of parents and pupils (the "social demand") are to be satisfied.

It is important that the two approaches should not be seen as mutually exclusive ways of estimating future demand for education. There may well be educational questions (both

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(1) Prepared by Mr. Graham Atkinson and Dr. Alan Little, OECD Consultants.

about the numbers being educated and types of education they are receiving), when the two types of estimates may conflict either in detail or in broad policy implications. When this happens the conflict ought to be resolved not by ignoring one or other of the estimates but by a rational choice between them and the social, political and economic assumptions upon which they are based. Fortunately, there are occasions when both sets of information are straws that point in the same policy direction, and as a result, policy can be more firmly based on rational criteria and therefore advocated with greater confidence. Finally, over time they can become almost the two sides of the same coin. Parents' demands for their children's education are partly based upon the judgements of economic opportunities (i.e., the social demand becomes partly a function of at least parental manpower estimates). In the same way the educational requirements demanded by employers from entrance to the labour market are partly a function of the numbers being retained in full-time education (manpower demand in this example becomes a function of the supply of trained personnel). Put another way, social demand is not formulated in an economic vacuum, nor are manpower needs developed without the reference to a wider social framework. For these reasons, the two approaches although analytically separate are in the real world inter-related. Neither should be allowed (separately or together) to determine policy, but both should inform it.

A. The Methods of Social Demand Assessment

The methods used in assessing enrolment and outputs of the various types of schools have already been described in Chapter II of this report, and the critical sector for a social demand assessment, however, is non-compulsory schooling. Before that age approximately 100 per cent of the age group will be enrolled in full-time education and as a consequence educational forecasting at this level is demographic forecasting. After the age of compulsory schooling, full-time education is voluntary, and it is for these age groups that forecasting is complex. In Austria, this means the following types of schools:

(a) General secondary schools leading to higher education;

(b) Secondary technical and vocational schools leading to higher education;

(c) Teacher training institutions.

Graduates from all three types of secondary education (maturanten) have the right of entry to higher education. It is these students that must be forecasted: both numbers at entry, enrolments in each grade, and graduates. Other groups of students must also be estimated:

(d) Intermediate vocational schools (school leavers from these institutions are ineligible to higher education);

(e) The percentage of qualifying people who enter higher education and the attrition rate in the universities.

The most convenient way of projecting both enrolments in higher education and voluntary enrolments in secondary education is to concentrate the attention on graduates from the latter. It is from this population that the entrants to the former come, and to calculate them, assumptions must be made about numbers entering voluntary secondary schooling, attrition rates, etc. In Austrian terms this means assessing the numbers of Maturanten. In order to do this the following sets of information are required:

(a) The size of the age group;

(b) Inflows over time into various types of secondary education;

(c) Rates of attrition or drop-out in voluntary secondary education;

(d) Output over time in voluntary secondary education;

(e) The effect of the 9th year compulsory schooling proposed by the 1962 Act on voluntary continuation;

(f) The variety of ages of the Maturanten;

(g) The extent to which current enrolment in voluntary secondary schools are minimised by lack of school places.

In the body of the report there are two separate estimates for future demand; the differences between the two estimates are the results of different assumptions about (d) and (g) above. For the Second Assessment it was assumed that retention rates within the system would not be affected by shortages of school places and also the time period for assessing the trend lines of voluntary enrolments and outputs was longer.

For forecasting up to 1975/1976 the size of the age group presented no difficulties. People aged 19 in that year were born in 1955/56. It was assumed that rates of entries into secondary schools would remain at the level of recent years. Further, attrition rates were held constant at the rates current in 1964/65 and it was assumed that 25 per cent of graduates would be aged 17, 50 per cent aged 18 and 25 per cent aged 19.

The most important result to emerge was that, on the basis of past trends, the overall percentage of secondary school graduation in 1975/76 could reach 17 per cent of the corresponding age group (the degree of confidence for this projection ranged from 16.08 per cent to 17.98 per cent). Thus if we assume a steady development over the next 10 years similar to that of the past twelve years it is likely that 16-18 per cent of an age group will graduate from secondary schools in the late '70's. The translation of the projection into actual numbers of pupils is shown in Table 50 for each of the school types, for 1950/55 to 1975/76.

The figures obtained from the first estimate are rather lower than these. Their differences stem from the different assumption outlined earlier. The First Assessment assumed a continuing scarcity of school places, and the time period covered by its trend analysis was rather shorter. Hence the differences. However, for both sets of calculations several assumptions, valid for purely statistical projection, were made which unfortunately have one central difficulty. The social psychological and economic factors underlying educational demand are not fixed or constant, but vary through time. Trend line analysis assumes that recent changes in these underlying factors are the only measure of future changes. The planner's problem is how far such an assumption (although practically inevitable) is likely to be found wanting by future events. In terms of a question: is it likely that the complex of factors that make up 'social demand' will change radically and unpredictably over the next ten years?

This is not only true for social demand forecasts. Dr. Steindl notes that the structure of the Austrian economy is changing profoundly at a pace which makes future projection of manpower "needs", or derived demand very difficult. In page 3 of his report he argues that providing the oversupply of trained manpower is not too great, an industrial economy can absorb it. Therefore he is not too concerned about the "accuracy" of the estimates made, and

Table 50

Output of the Austrian schools - Second Assessment(1)

		Index 100 = 1950/51						Index 100 = 1965/66		
		1950/51	1955/56	1960/61	1965/66	1970/71	1975/76	1965/66	1970/71	1975/76
General compulsory schools . .	N	73,690	97,700	91,170	23,410a)	86,870	97,990	80,350b)	86,870	97,990
	%	100	133	124	32	118	133	100	108	122
Compulsory vocational schools	N	23,200	36,730	38,910	41,180	37,170	44,300	41,180	37,170	44,300
	%	100	158	168	177	160	191	100	90	108
Intermediate vocational schools	N	6,490	10,310	10,058	7,900	9,470	12,560	7,900	9,470	12,560
	%	100	159	155	122	146	194	100	120	159
Intermediate schools for the training of teachers and educational assistants . . .	N	374	260	529	70c)	670	790	625d)	670	790
	%	100	70	141	19	179	211	100	107	126
General secondary schools . .	N	3,945	3,259	7,516	7,490	2,980e)	12,750	7,490	2,980	12,750
	%	100	83	191	190	76	323	100	40	170
Secondary technical and vocational schools	N	1,945	1,966	3,878	4,324	4,815	6,824	4,324	4,815	6,824
	%	100	101	199	222	248	351	100	111	158
Schools for higher social occupations	N	-	-	-	30	60	100	30	60	100
	%				100	200	333	100	200	333
Teacher training	N	880	670	929	2,130	1,975	2,530	2,130	1,975	2,530
	%	100	76	106	242	224	288	100	93	119
Institutions of higher learning	N	...	2,762f)	2,799	4,709	5,528	5,771	4,709	5,528	5,771
	%		100	101	170	200	209	100	117	123

(1) See notes to Table 5a in Annex to Chapter II for detailed breakdown of school types covered.

from his argument in the current Austrian situation it is possible to suggest that it is better to plan for an oversupply of trained manpower rather than the reverse. However, the central point is that for both manpower and social demand projections the basis for these projections is shifting and this makes accurate forecasting very difficult.

For example, apart from the technical problems involved in deciding the best time period on which to base an extrapolation of past trends, the main problem is highlighting those factors in the socio-economic and political institutional structures which may change the pattern of effective demand for education in the future or translate "potential" into "effective" demand faster (or slower) than past experience.

The next section attempts to isolate some of these factors, to analyse them, and to suggest the possible effects of changing them or switching emphasis between them.

B. Factors Influencing Social Demand

1. Economic growth and the demand for education

One important factor is the influence of economic growth itself on the demand for education. Many studies have explored this relationship and shown in general the correlation between size of Gross National Product and participation rates at all levels of education.(1) Similarly some studies have demonstrated that parental income is one of the many determinants of a child's educational opportunities. As both national and personal incomes increase so do national and personal educational aspirations. In Austria between 1958 and 1963 Gross National Product per occupied person increased by about 4 per cent per annum. Such an increase not only affects the amount which can be spent on education but also the demand for more of it. Graph 8 shows the broad relationship between economic growth and educational development in enrolments in Austria.

International comparisons reinforce the conclusion from this graph that if national and personal disposable income increases in Austria between 1966 and 1975, then this will tend to have the effect of raising the social demand for education. However, this is in part also included in the calculations based upon past experience. The trend lines discussed earlier are in part a reflection of economic growth and the impact of economic growth on educational enrolments. The difficulty is whether the relationship between income and educational demand is the same at all income levels. Put another way, is there a level of income which brings about a radically different relationship between educational participation and personal and collective wealth? An example of such a changing relationship might be Swedish experience since 1940. Economic development has been considerable over the past 25 years, but educational change has been even more profound. Whereas in 1940 only one young person in 10 aged 16-18 was at school, today the figure is one out of two and by 1970 it will be four out of five. This example does not question the general relationship between either national wealth or personal income and educational participation, but suggests that there may be certain points where the relationship becomes "explosive". In terms of school

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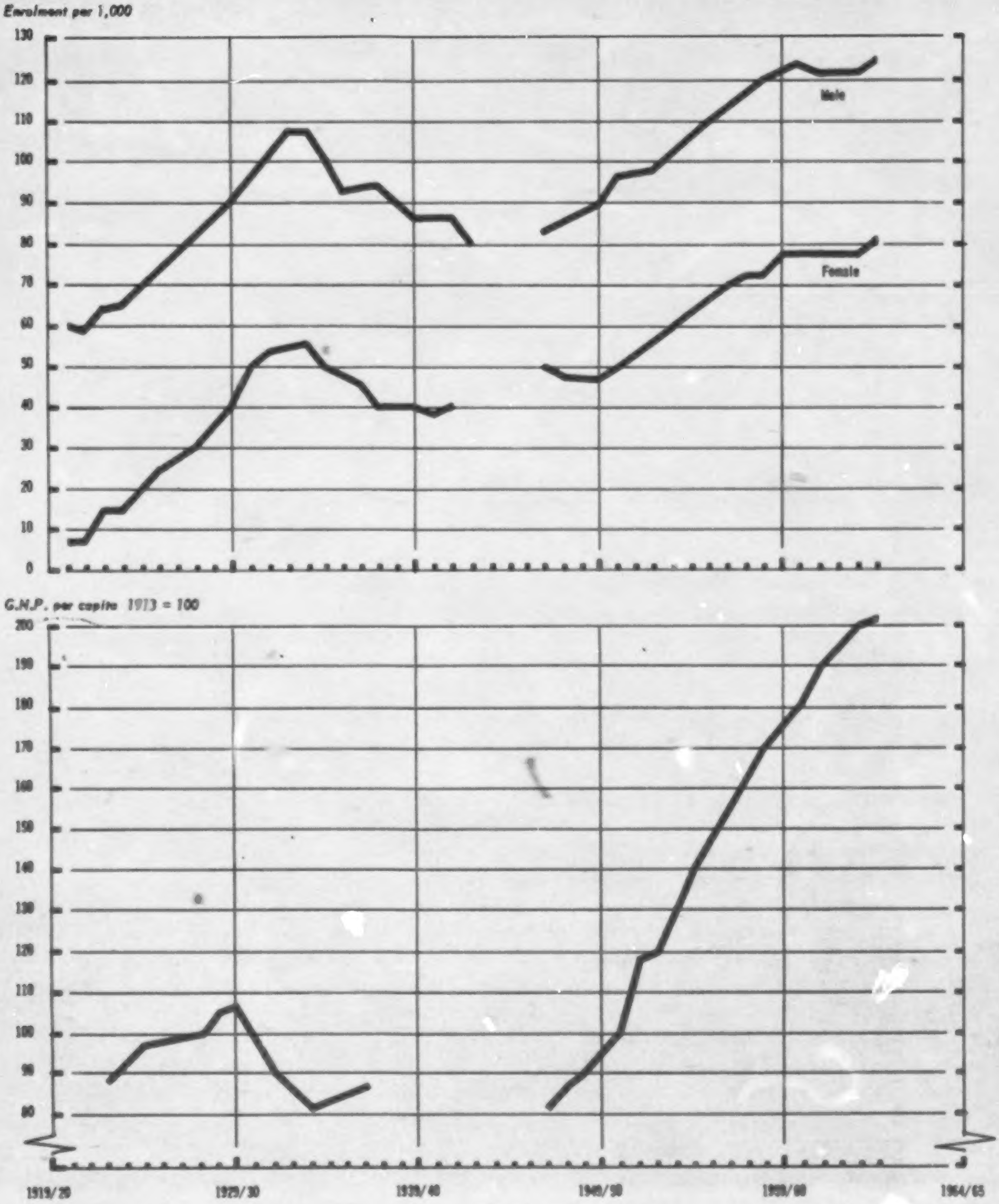
(1) See OECD Policy Conference on Educational Investment and Economic Growth. Washington 1961, Volume II.

Graph 8

A BROAD RELATIONSHIP BETWEEN ECONOMIC GROWTH AND EDUCATIONAL DEVELOPMENT IN ENROLMENTS IN AUSTRIA



participation there may be an income threshold beyond which the demand for education increases at a far faster rate than either personal or national income. The practical question facing planners in Austria is whether the Austrian economy is nearing such a threshold.

2. Factors impeding the release of "pent-up" demand

A second factor affecting the pattern of effective demand is the full implementation of the principles embodied in the 1962 School Organisation Act. The introduction of Section 1 of this report has described in detail the history and the circumstances surrounding the passing of the Act. Section 4 of the Act refers to the principle of the Universal Accessibility of Schools, and states:

> "Entry into every school shall be common to all, without discrimination as to birth, sex, race, social background, class, language or religion, with the proviso that schools and classes may be set up which are designed only for boys or only for girls."(1)

It is not possible to give a systematic appraisal of the present gaps between policy and practice. Nor can we fully show how this results in gaps between demand for and the opportunities to acquire education; or, the difference between potential and effective demand. Some examples may be given, however, which illustrate to some extent the margin of demand which is at the moment "pent-up".

(a) The gap between demand and available accommodation

One of the most obvious examples of the shortfalls between supply of places and actual demand is the number of qualified entrants who were not admitted to school. Entry to secondary technical and trade schools in Austria is at the age of 15, and Table 51 shows the percentage of qualified entrants refused entry to their schools in Austria and in Vienna.

Table 51

Percentage of qualified entrants refused admission to secondary technical and trade schools

	All Austria	Vienna
1955/56	15.4	29.1
1956/57	7.7	16.4
1957/58	2.7	15.9
1958/59	22.2	32.3
1959/60	6.6	3.6
1960/61	6.4	8.0
1961/62	8.4	11.0
1962/63	9.7	12.7
1963/64	3.7	3.7
1964/65	4.6	1.9

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(1) School Organisation Act, page 9, 1962 (bi-lingual edition 1965).

In Austria a proportion varying between 2.7 and 22.2 per cent were turned away because of lack of places between 1955/56 and 1964/65.

Actual size of the proportion being refused varied significantly from year to year, and to no small extent the variation is accountable for by the size of the age group. For example, in 1955/56 there were 128,900 youngsters of the relevant age group,compared with 113,300 a year later. However, the variations in the size of the age groups can only explain part of the variation. Some of the remainder is probably explained by the number of places available being reduced by the numbers of repeaters.

As the data for Vienna indicates,variations in refusal rates are not the same throughout Austria, for most years Vienna's refusal rates being significantly higher than that for the rest of the country. Again considerable unexplained annual variation takes place in refusal rates. Once more there is a relationship between refusal rates and the volume of applicants. In 1964/65 there were 1,299 applicants in Vienna compared with 1,836 in 1958/59: the refusal rates for these two years were 1.9 per cent compared with 32.3 per cent. But these annual variations need not concern this discussion: the problem here is to illustrate pent-up demand, not to suggest its magnitude. This cannot be done for all types of education because unfortunately this kind of statistical data was not available for all levels and types of schools. Accurate forecasts of future educational participation, however, require similar information at all levels of the system. Clearly, however, the participation of these pupils who were refused places in the past would have raised retention rates through the system, and consequently the number of graduates at output.

At first sight this example might appear to be covered by one of the assumptions made under the second estimate discussed earlier. It is assumed that shortage of places would not affect enrolments: however, this assumption referred to enrolments within a level of education and not to entrants at that level. The examples above are used to illustrate pent-up demand at the age of entry, not attrition through the system.

(b) Sex inequalities

International studies of educational participation show considerable differences between the enrolment rates for males and females. The 1962 Act seeks to eradicate differences between the sexes. Austrian statistics do not show precisely how different such participation rates by sex save in institutions of higher education. At this level, since 1954, there has been a pronounced increase in the proportion of female students.(1) But in 1964/65 there were still only 12,657 female students compared with 38,748 male students. Roughly speaking there were three times as many male as female undergraduates. Once more this type of comparison cannot be made for all levels of education, but similar differences are present at other levels and a larger expansion in enrolments will follow from their eradication. This view is supported by the special investigation completed in Burgenland: it suggests that for every girl with the ability to benefit from general secondary education in such a school, four girls were being educated in other types of school. Similar figures for boys showed that there were three boys not receiving such education for every two getting it. These figures are not representative of the reserves of talent for the whole of Austria. Burgenland was specifically chosen because its enrolment rates in general secondary education were the lowest in Austria, but these figures do suggest that the reserves of talent are greater amongst girls than boys. If the principles of the 1962 Act are translated into action, then the sex differences illustrated by the Burgenland example will be eliminated. In turn this means that forecasts based upon trend line extrapolations are likely to underestimate future educational enrolments. Unfortunately, without more detailed information about sex differences in school enrolments, it is impossible to indicate the size of this underestimation.

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(1) Chapter II, pages 22-23.

(c) Regional differences

The Burgenland Study(1) was specifically to discover not merely reserves of talent in the Austrian population, but to gain knowledge about it and regional differences in educational participation, and Chapter I of this report indicates quite widespread regional differences in participation within Austria. But some caution is required however in analysing these disparities. For example, it is well-known that many parents in the rural areas of the country send their children to the towns to go to school for the week, and return home the week-ends. Also the school statistics do not take into account the place of birth, or home residence, of the pupils. Such factors might modify the differences between regions, and it would require a specific piece of research to explore participation rates by home origin.

Nevertheless, we can see in Table 52 that the inflow into general secondary schools leading to higher education in Vienna is almost twice the national average. It is unlikely to be fully explained entirely by the above-mentioned factors. Further these types of regional and urban differences have been documented for other educational systems, where the reservations about pupil mobility do not apply. However, because of these reservations, the tables can only be given for illustration but they do illustrate considerable differences in enrolment between one area (Vienna) and the rest of Austria.

Table 52

Inflow into general secondary schools leading to higher education

	Austria %	Vienna %
1960	13.16	25.8
1961	12.74	28.6
1962	12.82	29.3
1963	13.20	30.9
1964	13.87	32.2

Source: First Future Assessment of Austrian E.I.P. Team

Differences like these do not only exist between regions, there are also differences between districts within the same urban area. The following table shows the extent to which the percentage entering ABHS (general secondary schools leading to higher education) varies within Vienna, and is the only statistical example of such differences available from Austrian sources.

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(1) Psycho-Pedagogical Service of Austria: "Reserves of Mental Abilities in the Burgenland", Austrian EIP/OECD Project, 1965.

Table 53

Variation in inflow, within districts of Vienna, into general secondary schools leading to higher education

4th class primary school (Volksschule) to 1st class ABHS average 1960-1964	Vienna districts
10-19%	XI, XX, XXI, XXII, XXIII
20-29%	X, XIV, XV, XVII
30-39%	II, III, V, VII, XII, XVI
40-49%	I, IV, VI, VIII, IX, XVIII
50-59%	XIII, XIX

Source: Oral evidence, Dr. M. Bittner, Vice President [illegible] Vienna School Authority, November, 1965.

In Austria, as in other countries, the explicit policy is to eradicate these kinds of regional differences by policies like school building programmes, use of boarding schools, and grants to pupils from isolated and underprivileged areas. If such policies bring about a narrowing in regional differences, then inevitably the social demand is likely to be much higher in the next ten years than in the last ten.

(d) Disparities along social class lines

Care must be exercised in estimating the extra demand which would ensue from the removal of such regional disparities, because they overlap considerably with social-class differences in participation. This has been suggested by studies in many OECD countries and particularly by Dutch research.(1) The author of the Dutch survey concludes: "From 1930 onwards grammar school enrolment is known for the 17 provinces in the Netherlands ..... Provinces with a low enrolment ratio in 1930 show the biggest increase. This points to a levelling out of regional differences in grammar school attendance. (Nevertheless) first entrance to grammar schools in 1957 shows great variations between regions. As a preliminary attempt to get an idea of the factors which determine these differences .... data on income, urbanisation, composition of the labour force,etc.,were assembled for regions with extreme participation rates .... The results of this lengthy analysis is that regional differences in grammar school participation are determined by differences in occupational distribution".

Although in Austria it is impossible to disentangle regional and class differences, some consideration must be given to the differences in social class participation. The evidence which is available for Austria is taken from preliminary research sponsored by the Austrian Institute fur Jugendkunde and undertaken by the Social Science Research group of the University of Vienna;(1) and some research by the Pedagogical Department of the Community of Vienna.(2)

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(1) Chapter 3 of the OECD Kungälv Conference publication (1961): "Ability and educational opportunity", p.69, "Regional inequalities in educational opportunity".

The following table has been drawn up from samples of apprentices, grammar school pupils and undergraduate students in Austria distributed according to social class (decided by the occupation of the family wage earner).

Whereas nearly three-quarters of all the apprentices originate in what are broadly working-class backgrounds, less than a fifth of grammar school pupils and undergraduates have the same social origin. The high participation of the much smaller "upper class" in the University is clearly apparent.

Within the Austrian grammar schools themselves there is found to be large class based differences. When the social structure of three different types of grammar schools was examined, two points emerged: firstly, there was a larger participation of the "upper class" in all types; secondly, there was, however, a relatively larger participation of the working class pupils in the "Real Schule".

Table 54

Social structure of Austrian secondary school and university students(1)

Class according to fathers' occupations(2)	Apprentices %	Grammar schools %	University undergraduates %	Monthly income Austrian schillings
Labourers and unskilled workers	29	1	2	1700
Artisans	45	6	6	2100
Employees, clerks	16	12	10	2500
Middle class(3)	10	39	41	3800
Upper class(4)	-	42	41	6000
	100 (735)	100 (489/347)	100 (14.393)	

(1) Without consideration of farmers' children (3-6%).

(2) Forecast from data on fathers' occupations of all Austrian male students in universities. From Austrian University Statistics Winter Term 1959/60, low Central Statistical Office.

(3) Middle level, middle-rank civil servants, employees in private enterprises, small tradesmen, low white-collar.

(4) Higher employees in private enterprises, higher civil servants, high white-collar and employers.

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(1) Published in "Four Points as Research Reports - Young People in the Economy and Society", Vienna University.

(2) "Jugend in Wirtschaft und Gesellschaft", Faculty of Social Science, 1962.

Table 55

Social structure of pupils from three different types of grammar school(1)

	Gymnasium %	Realgymnasium %	Realschule %
Working class	15	13	25
Middle class	37	35	40
Upper class	48	52	35
	100 (72/65)	100 (221/207)	100 (162/44)

(1) Vol.1, Part 1, G.20 II. Jugend in Wirtschaft und Gesellschaft

The evidence showing the same type of class biases in participation is available in many other countries and is further referred to in the Burgenland Study.(1) Again the main point is to illustrate a further way in which educational policy might influence future enrolment rates, this time by reducing social class inequalities in educational participation.

3. Policy measures to increase efficacy of transfer links

One further aspect of educational policy in Austria is important in this context, namely, the efforts to enable pupils to transfer from one type of secondary school to another. Earlier this report refers to "bridges and cross-links" between upper primary and general secondary school. Reviewing experience between 1956 and 1965 it concludes that the "efficiency" of such bridges is "very small indeed". Until 1962/63 less than 1 per cent of the total enrolments were transfers and in 1964/65 it was 1.4 per cent. The "second path education" given by the rural grammar schools and the grammar schools for employed persons can be seen as a further effort in the widening of entrance both to grammar schools and higher education. But despite the growing popularity of such "second chance" education, this reports concludes that "numerically it is not of great importance". Therefore, both transfers and second chance education are both disappointing in their frequency and in a sense statistically insignificant; there is no need at this juncture to discuss why this should be so. All we have to assert is the possibility that in the future educational policy might stimulate such devices as a means of tapping and involving hidden resources of educational talent in Austrian society. If such devices do convert potential into effective demand,then once again trend line extrapolation based on past experience prior to such conversion will grossly underestimate actual enrolments.

What follows from these points is that any accurate projection of future enrolments and outputs in Austria must allow for the degree to which educational policy - based on the 1962 Act - will successfully mitigate these ecological and socio-economic differences. It is clear that social, economic and psychological differences underpin the different rates of educational involvement in the past and projections for the future must try to allow for them.

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(1) In particular: 1. "Ability and educational opportunity", OECD, 1961. 2. "Pupil Guidance Council of Europe". 3."Social Objectives in Educational Planning", OECD, 1967.

The magnitude of this task is well illustrated by the pioneer pilot study of the Burgenland. Table 5(ii) of this study suggests that in Burgenland (which was deliberately chosen because it has the lowest rate of children attending secondary schools giving access to higher education) 362 young people attended these schools whilst 824 of the same ability did not attend. A policy explicitly designed to eradicate such differences would profoundly affect school enrolments. Furthermore social demand projections based upon past experience cannot include any estimate of the impact of such a policy, because past trends were unaffected by it.

The use of data which reflects past social demands gives us one way of predicting future outputs and enrolments. The above examples show that present and past trends may not accurately indicate the probable extent and pattern of future demand if agreed educational policy is implemented. The report of the study group on the Burgenland cites evidence from other countries to show that the geographical siting of schools influences social demand quite considerably. The same report argues that skillful use of financial resources for transport, books, boarding schools, grants, etc., might stimulate demand even more. Experience in other countries (especially France and Sweden) confirms this argument; in both countries mentioned, policies like those recommended in the Burgenland report have had considerable impact on school enrolments.

4. Reduction of attrition through qualitative improvements in the educational system

So far this discussion has ignored how policy can affect enrolments by influencing the rates of attrition. This was mentioned in the first two sections of the report. It is very relevant to the argument of this section; for if by methods of teaching, better use of selection techniques and better guidance of pupils in choice of careers the rates of attrition which are quite high in many types of Austrian schools are modified, then clearly enrolments will further increase. Qualitative changes in the educational experience will affect quantitative demand through influencing drop-outs.

Graph 9 shows the rate of retention (the converse of attrition) in "selective" schools in certain European countries. The report from which the data for other countries is taken stressed that much caution must be exercised in the interpretation of these figures:(1) "To discuss these differences meaningfully is difficult without a more intimate knowledge of the countries concerned. For example, the existence of a respectable qualification in the middle range such as the English "O" level or the German "miltelreife" will induce pupils to leave schools at this point".(2)

Further, it must be remembered also that the drop-outs from the selective schools could well go into different types of schools and therefore not be lost to the system completely.

Nevertheless we find that the Austrian data shows that there was approximately a 50 per cent drop-out between entry into, for example, the commercial schools leading to higher education

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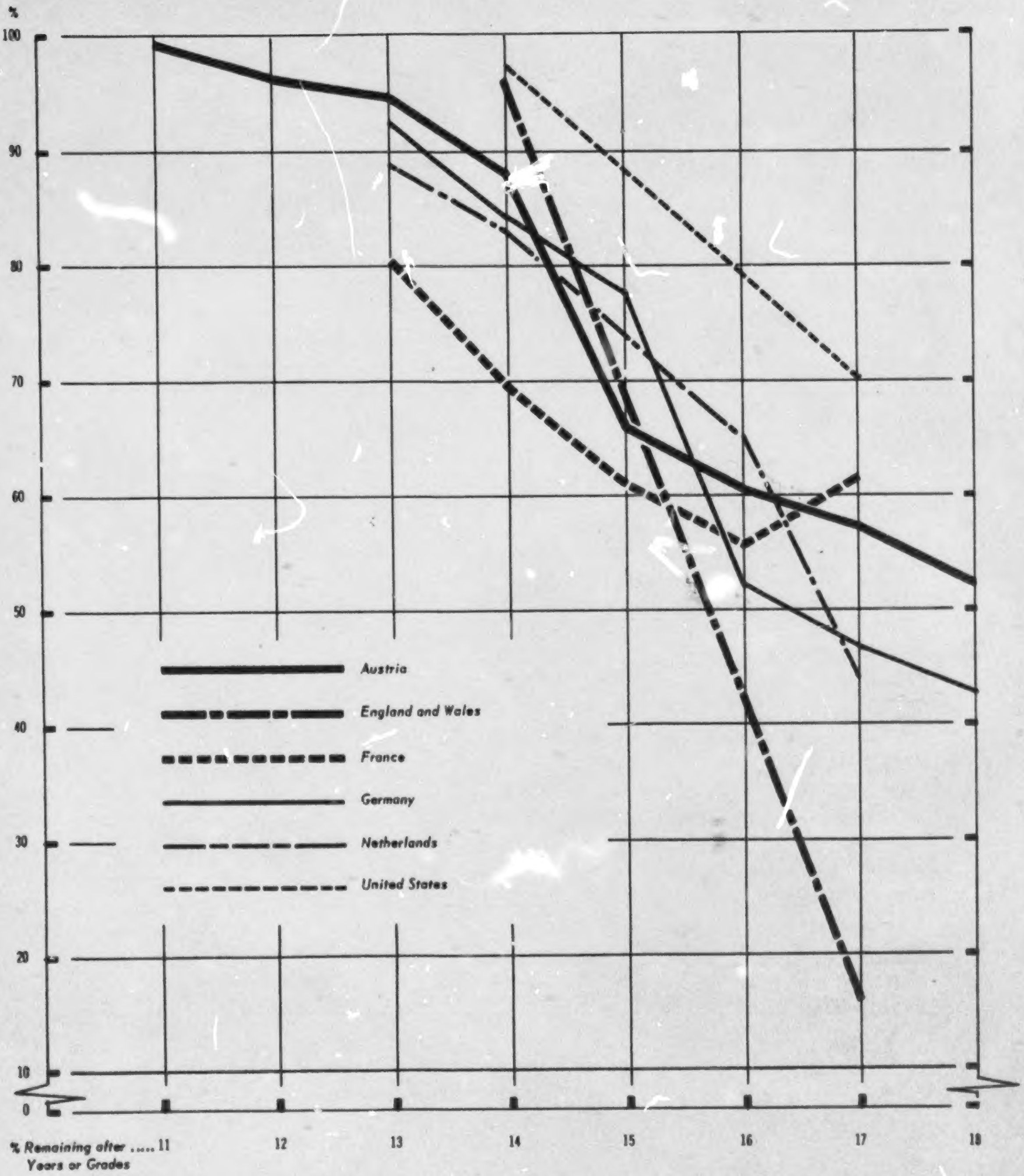
(1) The graph is taken from Rose Knight: "Trends in University Entry in Social Objectives in Educational Planning", OECD, 1967. Data for Austria has been added by the OECD Planning Bureau and is based on published Austrian statistics.

(2) "Trend in University Entry", Rose Knight. op.cit.

Graph 9

RETENTION RATES OF PUPILS IN SELECTIVE SCHOOLS



(Handelsakerdemia) at age 15 and the leaving examination. In the general secondary schools leading to higher education (A.B.H.S.) again there is a 50 per cent drop-out between entry and leaving examination. The following table gives these attrition rates in more detail.

Table 56

Percentage of entrants to secondary school not completing their course (1)

General secondary	49.4	(21.6% of 5th year entrants)
Schools for training of teachers	20.4	
Business academies	42.8	
Secondary technical and trade establishments	32.1	
Secondary schools for women's domestic and catering occupations	23.5	
Rural arts grammar schools and rural science grammar schools	54.0	
Arts grammar schools and science grammar schools for employed persons	72.0	

As has already been mentioned, the existence of an intermediary examination in general secondary education can influence retention rates in that type of education. In Austria roughly one out of two first [illegible]ntrants to general secondary education do not complete the course. However, attritio[illegible]ntage falls to one out of five entrants to the 5th year not graduating from the final [illegible] Nevertheless, even a wastage of one pupil in five is a significant one, especially ov[illegible] 3-year upper secondary course. Further, for most types of secondary schooling the attrition rates are even higher than this. One-third of entrants to technical and trade schools and four out of ten to business academies do not complete the course.

A further point is worth emphasising in this context: the detailed investigation of rates of attrition mentioned in the general report are already suggesting that these rates have not improved during the past twenty years. Fifteen per cent of entrants to secondary schools for future teachers in 1946/47 did not graduate, whereas twenty four per cent of the 1956/57 entrants had not completed their studies six years later. Between 1951/52 and 1956/57 the attrition rates of entrants to secondary commercial schools (leading to higher education) increased slightly from 44.6 per cent to 45.2 per cent. Detailed information like this over time is not available for other types of secondary education. But for these two types of schools these special studies suggest deterioration in the situation. But no matter what is happening over time, the general observation stands: one way of significantly increasing the supply of qualified people from secondary education, will be to reduce rates of attrition within the system.

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(1) See Chapter II, Table 27.

C. Summary and Conclusions

Both the projections in Chapter II were based on trend line analysis. They thus assumed implicitly that recent changes in the social, economic, political and psychological factors underlying the demand for education were the only measure of future changes. While calculations based on such an assumption are valid for purely statistical projection, the problem faced by the planner is whether modifications in those factors may be of such a nature or degree as to bring out a radical change in effective social demand that cannot be predicted from the observation of past trends.

One practical question that arises in this connection is whether, in an economy characterised by rising incomes, there is an "explosive"point beyond which the increase in the demand for education rises far more rapidly than either personal or national incomes - and whether Austria is approaching that threshold.

At the same time, the very objectives of Austrian policy pose a question of vital importance to future demand patterns: if the principles of full equality of educational opportunity enunciated in the 1962 Organisation Act, and the measures provided therein to achieve that equality, are fully implemented, in what way and to what extent will "pent-up" demand become effective?

Unfortunately, the inequalities which it is the aim of Austrian policy to eliminate can only be illustrated; data is not now available to measure them. However, the data which do exist, and the studies which have been carried out, show significant disparities in participation at the higher educational levels according to sex, region and social class. If, to take just one example, explicitly stated policies to eliminate regional inequalities through such measures as school-building programmes, use of boarding schools, and grants to pupils from disadvantaged areas are successful in narrowing regional differences in opportunity, effective social demand will be much higher in the next decade than in the past ten years.

Moreover, enrolments will rise still more rapidly if, at the same time, policies designed to improve the performance of the educational system (e.g., through improvements in teaching and pupil selection methods, guidance services, etc., are put into effect and succeed in reducing attrition rates.

If, as argued above, serious efforts are made to eliminate existing inequalities and, as a result, projections based on recent experience considerably underestimate both demand for education and actual enrolments, two consequences follow:

1. The experience of Austria and other countries suggests that the factors which may influence future enrolments are in operation both independently and inter-acting with each other, but to what extent and how quickly they will respond to educational policy initiative is not known. However, this uncertainty should not result in the acceptance of an educational policy which ignores such problems, or, in educational planners forgetting that these factors do affect both present and future enrolments.
2. The differences in educational enrolment outlined in this chapter stem from the socio-economic structure of Austrian society and from the nature of inter-personal relationships within it. They are, however, responsive to educational policy and practice. The siting of schools, the school building programme, the nature of financial aid in the way of grants, scholarships, subsidised meals, etc., given to pupils are all examples of obvious ways in which the educational system itself can increase or decrease school enrolment rates and in consequence reduce or intensify

inequalities in education. On top of this the nature of the school experience, the subjects being taught and the teaching methods used, are important influences on retention rates within the system. As a result an element that can be used to influence the demand for places in schools is the volume of resources given to education and the principles determining the distribution of these resources within education. Therefore, the educational system is a most potent influence on future social demand for education.

The problems discussed in this chapter have highlighted certain aspects of current educational practice of particular importance for educational planning in Austria. First, a change is necessary in the methods of presenting educational statistics. Throughout this chapter, problems of regional participation, class inequalities and differences in educational enrolments between the sexes, could only be illustrated. From existing data it is impossible to make a comprehensive statement about these differences throughout all levels of Austrian education. To plan and develop an educational system, comprehensive data of this type are essential.

It is only on the basis of such data that accurate estimates can be made of the full implications of current educational policy. The 1962 Act established and reformulated the principles of Austrian education. What is required now is a calculation of the implications of these principles for the educational system. In particular, questions like the demand for teachers, school space required, etc., can only be fully answered when a clear impression has been obtained of the gap between the existing educational situation and agreed educational principles. At the moment one can only illustrate this gap; unfortunately, because of the absence of the necessary data, it was not possible to assess its magnitude or its implications for educational policy.

Improved statistics themselves are not sufficient; they are a first step in the direction of rational and scientific educational policy. From them an accurate picture can be obtained of educational participation in Austria. However, such a picture will not explain why such differences exist in educational participation.

The study by Professor Preisitzer of the University of Graz, especially prepared for the E.I.P. project, briefly recounts the variety of economic, political, sociological and psychological influences that are related to educational performance and must be considered if we are to understand the problems of educational inequalities.(1) Fundamental research is required into these problems if we are to achieve this understanding and the impetus of such research might well come from educational policy-makers.

Educational research must not concentrate exclusively upon the problem of describing and understanding educational inequalities. The argument in this chapter has been that the educational system itself can break the circle of self-perpetuating inequalities in education that exist in all European systems. Research must investigate how the school system itself can overcome known differences in educational participation. Already, much is known about the influence of shortages in school places, etc., on school enrolments. What is not known is the way in which, for example, the classroom experience can influence pupils' educational aspirations. It is on this level, the level of what is being taught and how, that there is an urgent need for educational research.

From improved statistics, an assessment of educational needs can be made; this can be amplified by research into the complexity of factors influencing enrolment rates and the part the school system can play in mitigating these influences. But even the sum of research plus better statistics does not add up to educational policy. However, in large measure, policy ought to be based upon both, and so, administratively, a way must be found of using research in the decision-making system and ensuring that future policy implementation is continually informed by ongoing investigations. While research is no substitute for educational policy, it can provide a good basis for it.

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(1) K. Preisitzer, "Social Demand for Education in Austria", 1965.

Chapter V

THE RESOURCES NEEDED TO ACCOMMODATE THE PROJECTED EXPANSION IN ENROLMENTS[1]

Introduction

Chapter II showed, on the basis of rather conservative estimates, the pupil flows that can be expected through the Austrian educational system during the decade 1965-1975. That the realisation of even the more expansionist of the two projections contained therein would not meet the needs of an economy on the threshold of major changes is clear from the analysis of skilled manpower requirements as estimated by Dr. Steindl in Chapter III. And the central point of Chapter IV was that, if a strenuous effort is made to eliminate existing inequalities in educational opportunity, projections based on recent experience will probably underestimate the social demand that will make itself effective in the future.

The present chapter indicates the considerable resource requirements that have to be met to accommodate an expansion of even the general order of magnitude forecast in Chapter II. It deals with the three main types of resources whose mobilisation will present the most serious problem over the next decade: schoolroom accommodations, teachers and finance.

The discussions of school space and teacher requirements (Sections A and B) are summaries of more detailed studies carried out as part of the Austrian EIP project.

A. Demand for School Accommodations, 1965-1975

1. General compulsory schools (excluding the Polytechnic Course)

The projection of school accommodation needs was built upon enrolment estimates that

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(1) Section A of this chapter is based on more detailed studies undertaken by Dipl.Ing. Schlesinger (general compulsory schools) and Dr. Franz Loicht and Dr. Hans Czermetschka (intermediate and secondary schools).

Section C (Financing of Education) was prepared by Mr. Cornelius Peter Van Dijk, OECD Consultant.

were made independently of those drawn up by the Austrian Statistical Office (1st Assessment, Chapter II) and by a radically different method. Yet the differences in the results were minor.

The procedure used in the present case was briefly as follows: the headmasters of general compulsory schools throughout Austria were asked to supply data on the number of pupils, classes, and classrooms and other facilities existing on 1st January 1965 as well as estimates regarding pupils and classes on the same date in 1970 and 1975. These estimates took account of such factors as local school building and enlargement projects, maximum numbers of pupils per class under the 1962 School Organisation Act,(1) and the consequences expected to result from structural population changes, housing and area development projects, provision of school transport facilities, etc. The fact that the investigation originated at the local level prevented unwarranted assumptions being made as to the general applicability of trends in certain areas.

These local reports formed the basis for overall demand assessments carried out at the level of each of the Provinces. The Provincial estimates were made with, inter alia, the following considerations in mind: the division of responsibility between Federal and Provincial authorities, the factors influencing the choice of type of school attended by pupils, and recommendations which had been made with respect to rural schools and dealing with such matters as school organisation, the provision of school space and its use, the consolidation of school units, etc.

The projections of the numbers of pupils and classes are summarised in the table below for all of Austria. Although these projections were made for both public and private schools, only the public sector is included here as the projection of building needs and costs which follows concerns that sector alone. (Private schools account for about 3 per cent of all pupils in general compulsory education).

Table 57

Projection of numbers of pupils and classes in public general compulsory schools (excluding the polytechnic course)

	Pupils on 1/1/			Classes on 1/1/			Number of schools on 1/1/65	Number of class-rooms(1) on 1/1/65
	1965	1970	1975	1965	1970	1975		
Totals for all of Austria	744,204	868,302	921,371	24,306	28,141	29,465	5,196	23,605
Trend	100	117	124	100	116	121		

(1) Does not include auxiliary teaching spaces, such as gymnasia, art and music rooms, handicraft rooms, etc.

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(1) See Chapter I, Section A4.

The new school facilities that will be made available between 1965 and 1975 as a result of the building projects reported by the Provinces - again excluding the polytechnic course - are as follows:(1)

Table 58

New school facilities, 1965-1975, (excluding polytechnic course)

New buildings and enlargements	1,355
New classrooms	6,861
Other teaching rooms:	
All-purpose rooms	1,031
Gymnasia	326
Total building and enlargement costs (1964 prices)	4,335 billion Schillings

The completion of this construction programme will still leave a deficit in 1975 (excluding Vienna) of 2,414 classrooms. To this must be added the Salzburg building and enlargement projects, which will provide 508 classrooms. This gives a total of 2,922 additional classrooms whose cost must be added to that of the building programme indicated above. If it is assumed these classrooms are all accommodated in buildings of six classrooms each (plus one all-purpose room in each building), 487 buildings would be required, involving a total capital expenditure of 1,460 billion Schillings. Thus the total cost for new buildings and enlargements would come to about 5.8 billion Schillings. In addition, the costs involved in maintenance of old buildings, renovations, provision of additional space for gymnasia and work rooms, and replacement of schools no longer usable would amount to about another 700 million Schillings. The total estimated capital expenditure for 1965-1975 is then 6.5 billion Schillings. If, however, the construction of gymnasia and workrooms is temporarily postponed, the above total might be reduced to some 5 billion Schillings.

2. Intermediate and secondary schools(2)

A similar investigation was carried out with respect to intermediate and secondary schools. Local headmasters were asked to provide data on the numbers of pupils and classrooms and other educational facilities existing in 1964/65 and to estimate the pupil and classroom figures for 1969/70 and 1974/75. These local estimates took account, inter alia, of existing school building and enlargement plans, the extended duration of both compulsory schooling and of general and other secondary school courses, the reduction of maximum class size under the 1962 School Organisation Act,(3) the rising social demand, the likely changes in the economic or demographic structures of the relevant catchment areas, etc.

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(1) The Salzburg Province report is not included here as it did not indicate the number and types of buildings projected but only the number of new classrooms. These are accounted for below.

(2) The intermediate schools do not provide access to higher education. See Chapter I for the various types. For purposes of convenience, the term "secondary schools" will frequently be used in this chapter to designate all second-level establishments - both intermediate schools and secondary schools providing access to higher education.

(3) See Chapter I, Section A4.

At national level, the local estimates were critically examined and revised by the Federal Ministry of Education. It should be noted, in this connection, that authority for legislation and implementation in relation to the establishment, maintenance and abolition of all State secondary schools lies with the Federal Government.

The local estimates showed a projected enrolment increase in all types of secondary schools from 15.3 per cent of the relevant age group in 1964/65 to about 19.3 per cent in 1969/70. This participation figure was considered unfeasible by the Ministry official in charge of school building in view of the marked prospective rise in enrolment due to demographic developments alone and the limitations - for financial, administrative and technical reasons - on the amount of new school space that could be provided in the time period concerned. Following the critical review of the estimates at Federal level, it was foreseen that a participation ratio of 16.9 per cent would be reached by 1969/70 and 19.8 per cent by 1974/75.(1)

Table 59

Evolution in enrolments and numbers of classes, and projection of new classrooms needed, 1964/65-1974/75, for all types of secondary schools(1)

	No.of pupils	No.of classes	Existing classrooms	Extra classrooms needed
1964/65				
All schools	138,561	5,294	4,482	911
Public schools alone	105,419	4,047	3,262	805
1969/70				
All schools	162,333	6,409	5,473	1,158
Public schools alone	123,910	4,908	4,248	814
1974/75				
All schools	220,873	8,853	5,473	3,414
Public schools alone	169,153	6,776	4,248	2,529

(1) N.B. As construction and enlargement plans do not yet exist for the second half of the decade under consideration, the estimated "Existing Classrooms" are the same for 1969/70 and 1974/75. It should also be pointed out that the only data available on the provision of additional classrooms in the private sector during the period covered constituted an estimate for five more classrooms to be made available for grammar schools mainly for future teachers. Thus, the difference between "Existing Classrooms" in 1964/65 and 1969/70, as shown above, is almost entirely accounted for by the public sector.

Source: Tables on pages 23 and 24 of the OECD-EIP study document, DAS/EID/66.26, September, 1966. (Mimeo).

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(1) These ratios do not include enrolments in the secondary schools for employed persons, whose pupils belong to widely varying age groups.

A summary of the results of the inquiry for all types of secondary schools - according to the corrected estimates of the Federal Ministry of Education - is given above. It should be noted that figures are provided for both the public and private schools considered together and for the public sector - which is the sector involved in State building projects - taken separately.(1)

B. Demand for Teachers, 1965-1975

1. Components of teacher demand

The estimates of total teacher demand constitute the sum of the various distinct elements that make up such demand. It will be well, at the outset, to define these components as they are understood here.

(i) Expansion demand is the additional teacher requirement that is due to expansion in enrolments resulting from: (a) demographic factors, (b) rising social demand, (c) the extension of compulsory schooling and the increase in the length of studies at secondary schools, and (d) the creation of new school types, such as the Teacher Training Colleges (Pädagogische Akademien).

(ii) Replacement demand designates the shortages caused by retirement at the legally permitted age (the number of teachers who are not expected to retire at that age must, of course, be accounted for - see below).

(iii) The wastage rate is the rate of loss of teaching personnel caused by death, temporary retirement, resignation, leaves of absence, and promotion to the inspectorate or the administration.

In order to determine the incidence of these demand components, a number of preliminary studies were made on such factors as the age structure of teachers in the various school types, wastage rates, and the percentage of those who, according to sample surveys, may actually be expected to retire at the permitted - but not obligatory - age of 60. In calculating the expansion demand, the principal basis used for ascertaining the expected growth in enrolments was the investigation carried out in connection with school accommodation needs summarised in Section A above. It is important to note that the teacher demand projections which follow all encompass both public and private schools.(2)

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(1) The role of the private schools is much more important in secondary than in compulsory-level education. The share of private schools, in terms of number of pupils, is indicated in Section C1 below.

(2) The role of the State in relation to teachers in private schools may be seen from the fact, inter alia, that the State subsidises the salaries of 60 per cent of the teachers in the Roman Catholic schools - which constitute by far the major part of the private sector. The subsidy usually takes the "live" form of teachers supplied by the State.

2. Teacher demand for general compulsory schools

In estimating teacher expansion demand, the projected future enrolments were taken from the school accommodation survey (Section A above), while the number of teachers per class for the various sizes and types of school were calculated in accordance with the provisions of the Finance Equalisation Act of 1959.

In the case of the Polytechnic Courses, which have just begun in 1966/67, a somewhat different basis of calculation had to be used. The enrolment projections employed here were those of the 2nd Assessment (Chapter II), brought up to date. And in the absence of appropriate legal provisions, it was assumed there would be one teacher to every 20 pupils.

The wastage rate was assumed constant at the 1963 level of 1.86 per cent of the total teaching force per year. Although this rate is, in fact, expected to rise in view of the increasing proportion of female teachers (see pictorial diagram VI in Chapter VI), this evolution cannot be expressed numerically.

Finally, three alternative possibilities were considered with respect to replacement demand resulting from retirement: (a) that all teachers will retire permanently upon reaching the age of 60; (b) that only every second teacher will do so; and (c) that no teacher will retire permanently prior to the age of 65.

The present age structure of the teaching corps indicates that a rapid increase must be expected in the number of retirements over the coming decade. It has been calculated, for example, that in the general compulsory schools, the number of retirements would, on the assumption that no teachers retired until reaching 65, increase from 306 in 1966 to 676 in 1976. The graph below shows the age structure of teachers in the compulsory and secondary schools; separate curves are provided for each of the various school types, and an additional curve indicates the overall age structure for the compulsory and secondary schools as a whole.

It was considered that in projecting replacement demand, alternative (b) mentioned above - that every second teacher will retire at 60 - would probably reflect the true situation most closely. Therefore, while total demand estimates were made on the basis of all three hypotheses regarding retirement, the replacement figures included in the tables below are those computed in accordance with alternative (b).

Two points should be stressed in connection with Table 60:

First, while the projections made so far have been necessarily the outcome of single investigations, the different variables concerned in fact all influence one another. For example, a marked broadening of the age range of the teaching force will increase the number of staff losses as a result both of death and temporary retirement and of reductions in the statutory number of teaching periods per teacher. And a continuing increase in the number of female teachers will produce higher losses due to leaves of absence and premature retirement. Planning will thus have to be based on a dynamic approach in dealing with all the interdependent variables.

Secondly, these projections must be considered as providing the general guidance for Austria as a whole, since most matters concerning the compulsory schools come under the competence of the Provinces, and detailed assessments can only be made on a regional basis.

3. Teacher demand for compulsory vocational schools

The compulsory vocational schools - part-time courses for apprentices - are unlikely to present any serious teacher supply problem. With respect to replacement demand, the age structure of teachers in these schools for the relevant years is roughly comparable to that

Graph 10

AGE STRUCTURES OF TEACHERS IN PUBLIC AND PRIVATE AUSTRIAN SCHOOLS

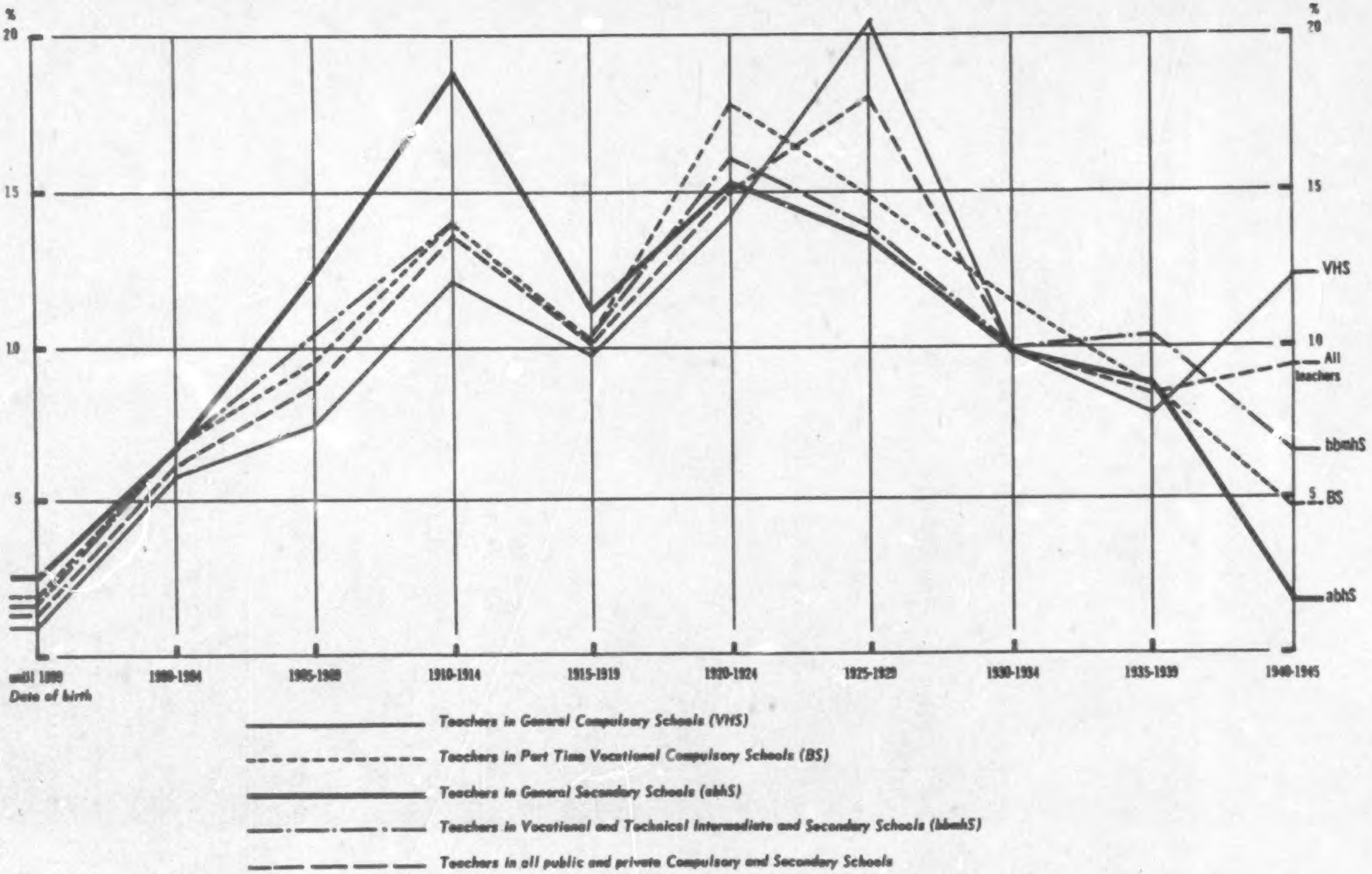

Table 60

The demand for general subject teachers for public and private primary, upper primary and special schools

(From 1966/67 including the Polytechnic Courses)

Calculation according to alternative B

(Assuming that only every second teacher makes use of the legal provision permitting permanent retirement on completion of his 60th year)

School-year	Calculated teaching-force target	For five years					For one year: average total need in round figures
		School-year	Replacement demand	Wastage rate	Expansion demand	Total demand	
1964/65	29,000						
1969/70	35,000	1965/66 to 1969/70	2,300(a)	2,600	6.000	10,900	2,180
1974/75	37,300	1970/71 to 1974/75	2,700(b)	2,950	1,800	7,450	1,490

(a) It was assumed that from 1.1.1965 to 31.12.1969 all teachers born between 1900 and 1904 inclusive will retire permanently but that of those born between 1905 and 1909 inclusive only every second teacher will retire. Retirements in 1964 are taken into account. It was further assumed that the number of teachers in private schools who stay in active service beyond their 65th year will not materially change and is therefore assumed to remain constant.

(b) It was assumed that in the period from 1.1.1970 to 31.12.1974 the remaining teachers born in the years 1905 to 1909 will retire, but that of those born between 1910 and 1914 only every second teacher will retire permanently.

of the general compulsory schools. But no expansion demand of any consequence is expected since enrolment figures will decrease in the next few years as a result of the introduction of the ninth compulsory school year and will subsequently increase only slightly. There will, in fact, be a temporary surplus of teaching staff in the first three years after the lengthening of obligatory schooling, and this is expected to be absorbed by the need for teachers in the polytechnic courses.

4. Teacher demand for intermediate and secondary schools(1)

The general compulsory school demand estimated above was for general subject teachers possessing diplomas for teaching in primary, upper primary or special schools. These teachers will be dealt with as a single category when, later in this Section, supply and demand are confronted in order to determine estimated deficits. In the case of the intermediate and secondary schools, however, no meaningful projections can be made without a breakdown as to qualification, since demand here is divided with respect both to subject taught and type of teaching diploma required. Hence, the calculation of demand at the secondary level proceeded in several steps:

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(1) The term "secondary schools" will frequently be used here to indicate the whole range of intermediate and secondary establishments; see footnote at beginning of Section A2 above.

(a) Overall demand

This will be shown in some detail for the general secondary schools; for the other types of secondary school the overall results will be given in summary form.

Expansion demand rises much more steeply for secondary than for primary teachers. This rise, as it affects the general secondary schools, is shown in the table below. As in the case of the compulsory schools, the future enrolment projections are based on the survey of school accommodation needs (Section A above):

Table 61

Projected rise in enrolments and number of classes in public and private general secondary schools

	Enrolment figures	Index	Number of classes	Index
1963/64	90,208 (a)	100	3,162 (a)	100
1964/65	94,678 (a)	105	3,257 (a)	103
1969/70	108,436 (b)	120	4,186 (b)	132 (c)
1974/75	148,957 (b)	165	5,966 (b)	189 (c)

(a) According to the official school statistics.

(b) According to the school accommodation survey; the figures resulting from that survey have been reduced by the estimated numbers of pupils in the intermediate schools for the training of teachers and educational assistants ("Mittlere Lehranstalten der Lehrer - und Erzieherbildung").

(c) The increase in the number of classes, which appears to be particularly rapid when compared with the pupil increase, is due to certain assumptions made with regard to the average number of pupils per class.

In order to arrive at teaching force target figures, the number of classes shown in Table 61 was multiplied by the average number of weekly periods per teacher as fixed by the curricula: the target size of the teaching force was assumed to rise in direct proportion to the increase in this product. The latter figure was calculated at 35 for the grammar schools mainly for future teachers, and 32 for each of the other types of general secondary school, account being taken of the expected shifts in the distribution of pupils and classes as among the various school types. The target figures thus arrived at were: 1963/64: 7,205; 1964/65: 7,430; 1969/70: 9,563; 1974/75: 13,617. This represents an indexed rise from the base figure 100 in 1963/64 to 189 in 1974/75.

The wastage rate, calculated on the basis of estimated present figures, was placed at 1 per cent of the teaching force per year. It is lower than that prevailing in the compulsory schools, largely because of the smaller proportion of female teachers.

With respect to replacement demand, the age structure of the teachers is such (see Graph 10) that the increase in the number of retirements over the next decade will be even

Table 62

The demand for teachers for public and private general secondary schools

(Assuming that only every second teacher makes use of the legal provision permitting permanent retirement on completion of his 60th year)

School-years	Calculated teaching-force target	For five years:					For one year: average total need in round figures
		School-years	Replacement demand	Wastage rate	Expansion demand	Total demand	
1963/64	7,205						
1964/65	7,430	1964/65	(58)	(74)	(255)	(387)	(387)
1969/70	9,563	1965/66 to 1969/70	931 [(a)]	356	2,133	3,420	680
1974/75	13,017	1970/71 to 1974/75	1,117 [(b)]	347	4,054	5,518	1,100

(a) It was assumed that from 1.1.1965 to 31.12.1969 all teachers born between 1900 and 1904 inclusive will retire permanently; but that of those born between 1905 and 1909 only every second teacher will retire. Retirements in 1964 are taken into account.
It was further assumed that the number of teachers in private schools who will stay in active service beyond their 65th year will not materially change and is therefore assumed to remain constant.

(b) It was assumed that in the period from 1.1.1970 to 31.12.1974 the remaining teachers born in the years 1905 to 1909 will retire, but that of those born between 1914 only every second teacher will retire permanently.

more rapid than in the compulsory schools. On the assumption that no teachers retire until the age of 65, there would be 74 retirements in 1966, still only 108 in 1970, but as many as 308 in 1978. It was, however, considered that, as in the case of the compulsory schools, the most realistic hypothesis was that every second teacher would retire at the permitted age of 60.

These, then, are the elements which went into the calculation of total teacher demand for the general secondary schools, as shown in the table above.

Similar computations were made for the other types of secondary school. The main results of these projections (which, again, include both public and private schools) are summarised below for the whole decade 1964/65 - 1974/75:

(i) For technical, trade and arts-and-crafts vocational schools, and secondary technical and trade schools: Total demand 2,509, to meet teaching force target of 3,719.

(ii) For intermediate and secondary commercial schools (i.e. commercial schools and business academies): Total demand 1,394, to meet teaching force target of 2,118.

(iii) For intermediate and secondary schools for women's domestic occupations: Total demand 937, to meet teaching force target of 1,941.

(iv) Thus for all intermediate and secondary technical and vocational schools [(i), (ii) and (iii) above], the total demand is 4,840, to meet teaching force target of 7,778.

The wastage rate which was calculated for the above school types on the basis of the target teaching staff, was put at 1.6 per cent. With respect to the replacement demand, the most realistic alternative was, again, considered to be that every second teacher would retire at the age of 60.

Special mention should be made of the fact that as part of the calculation of replacement demand, a detailed breakdown by subject-matter teaching qualification was made for all Austrian public and private intermediate and secondary schools. For the whole period from 1965 to 1975, as well as for various portions thereof, tabulations were drawn up showing: (a) absolute replacement demand by subject (the number of teachers it will be necessary to replace in each subject for the time-periods covered), and (b) relative replacement demand (these numbers expressed as a percentage of the total number of existing teachers qualified to give instruction in the subject concerned).

The differences between absolute and relative replacement demand were seen to be very striking. For example, for the period 1965-1974, the four subjects having the highest absolute replacement demand for the general secondary schools were mathematics (363), German (336), natural science (268) and geography and economics (193). The subjects in which replacement will be most urgent in terms of relative demand were, however, plane and solid geometry (54 per cent), fine arts (30.6 per cent), mathematics (29.8 per cent) and chemistry (29.5 per cent) - the fourth of these, chemistry, having been next to the last item in the absolute demand listing.

The importance for planning purposes of a relative replacement demand ranking is clear, since it pinpoints those subjects in which the possibilities for adequate instruction may be jeopardised if vigorous measures are not taken. So far, however, it has not been possible to break down expansion demand by subjects since this depends on factors for which a basis of calculation was not yet available - e.g. time-tables and curricula for the upper divisions of the general secondary schools and information on the distribution of types of upper divisions over the individual school locations.

(b) Breakdown by types of teaching diploma required

The total secondary school demand summarised in Table 62 above, and in the paragraphs that follow it, was subsequently broken down by type of educational diploma required. This was done in the following way: first, the existing distribution of teachers possessing the various types of diplomas was determined for each category of secondary school. The resulting ratios were then applied to the figures for overall future demand. The base year used for determining existing distribution was 1963/64 for the general secondary schools and 1964/65 for all the other categories. This extrapolation of existing patterns was necessary because it is not possible at the present time to say how the distribution will change over the next decade.

An example of this procedure:

It was determined that in the base year 1963/64, of all teachers in general secondary schools, 86.83 per cent had diplomas for teaching in general secondary schools, 6.51 per cent for the general compulsory schools and 0.33 per cent for technical and vocational schools, while 0.03 per cent held engineering diplomas and 6.3 per cent possessed other qualifications. These percentages were then applied to the figures for total future teacher demand in the general secondary schools given in Table 62 (e.g. 3,420 for the period 1965/66 - 1969/70) in order to determine, in absolute numbers, the teaching staff that would be needed for each category of diploma qualification. Similar computations were performed for all the other secondary-level school types.

It will be noted that the general secondary school example above shows a wide variety of types of qualification. In fact, there are teachers with different kinds of diploma in nearly every type of school. This is important to keep in mind for a clear understanding of the method used in drawing up the supply/demand balance sheet presented below.

5. Demand, by diploma qualification, for secondary and general compulsory schools considered together

It was now necessary to add the total demand for teachers in the general compulsory schools, given in Section B1 above, to the appropriate qualification category - i.e., teachers qualified to teach in general compulsory (primary, upper primary or special) schools. The breakdown of secondary school demand will already have placed a number of teachers in this diploma category, since all secondary school types have some - usually a small percentage - of staff members with only compulsory school teaching qualifications.

The next step was to add up the demand for holders of each type of diploma - regardless of the kind of school for which they are needed. The results of this operation are shown below:

Table 63

Total teacher demand, by diploma qualification, for general compulsory and for intermediate and secondary schools considered together

For the period 1965/66-1969/70

Teachers with an education diploma:	
- For secondary schools	3,513
- For technical and vocational schools	368[a]
- For primary, upper primary or special schools	11,189
Holders of a diploma in engineering and engineers	336
Holders of a diploma in economics and business administration	117
Teachers with other qualifications	731
Total	16,254

(a) The number of teachers with the diploma of education for vocational schools, who are needed for the compulsory vocational schools, are not included in this figure.

Table 63 (continued)

For the period 1970/71-1974/75

Teachers with an education diploma	
- For secondary schools	5,643
- For technical and vocational schools	643[a]
- For primary, upper primary or special schools	7,922
Holders of a diploma in engineering and engineers	425
Holders of a diploma in economics and business administration	196
Teachers with other qualifications	1,045
Total	15,874

(a) The number of teachers with the diploma of education for vocational schools, who are needed for the compulsory vocational schools, are not included in this figure.

6. Teacher supply and demand balance sheet

It should now be clear that the supply/demand balance sheet to be given at the end of this section will be broken down by types of diploma qualification needed - and not by types of school in which the teaching is to be performed. It must be added that this balance sheet will cover only the two types of diplomas which account for the overwhelming majority of teachers in the general compulsory and intermediate and secondary schools: the diplomas for teaching in the compulsory (primary, upper primary or special) schools, and the general secondary school teachers diploma. Teachers who possess such other qualifications as the diploma in engineering, or in economics and business administration, or who are secondary-school engineers, designers, etc.,usually work in industry before entering the teaching profession, and their replacement is not, in the first place, the concern of the educational authorities.

In order to estimate teacher supply, the appropriate experts were consulted as to what percentage of the graduates of the various teacher training programmes could be expected actually to enter the teaching profession. These percentages were then applied to the output of the teacher training courses as given in both the 1st and the 2nd Assessments of Chapter II. It was then possible to confront supply and demand estimates and to project supply deficits. This balance sheet is shown in the tables below.

Table 64

Projected deficit of teachers holding general compulsory (primary, upper primary or special) school teaching diplomas

Round figures

	According to First Assessment	According to Second Assessment
For the period 1965/66 - 1969/70		
Total teacher demand	11,200	11,200
Number of posts not occupied according to an enquiry by the Ministry of Education of 15/10/65	+ 3,000	+ 3,000
This would entail a total demand of	14,200	14,200
Prospective supply	- 8,500	- 8,900
Teacher deficit	5,700	5,300
For the period 1970/71 - 1974/75		
Total teacher demand	7,900	7,900
Deficit incurred during the first five years of the period covered by the forecast	+ 5,700	+ 5,300
This would entail a total demand of	13,600	13,200
Prospective supply	- 8,700	- 9,550
Teacher deficit	4,900	3,650

Table 65

Projected deficit of teachers holding general secondary school teaching diplomas

Round figures

For the period 1965/66 - 1969/70	
Total teacher demand	3,500
Number of posts not occupied according to an enquiry by the Ministry of Education of 15/10/65	+ 400
This would entail a total demand of	3,900
Prospective supply (1)	-2,100
Teacher deficit	1,800
For the period 1970/71 - 1974/75	
Total teacher demand	5,650
Deficit incurred during the first five years of the period covered by the forecast	+1,800
This would entail a total demand of	7,450
Prospective supply (1)	-2,350
Teacher deficit	5,100

(1) Based on a special investigation made in 1966.

C. The Financing of Education, including a Projection of Public Educational Expenditure to 1975

1. General financial review

(a) Introduction

Before giving an outline of the system of financing education in Austria and making a projection of future public expenditure on schools and universities, it will be worthwhile to give a brief description of the total system of public finance in Austria. This review of the general framework of government finance, of which the financing of education is only one segment, will enable us to obtain at least some idea of the relative importance of government spending on education in relation to the total budget, of the main sources of revenue and their elasticity, of the financial strength of the various levels of government (central, regional and local) and of the inequalities in fiscal capacity and school expenditure between the regions. Above all, this review will enable us, in the last chapter of this report, to evaluate the ways of financially implementing the planned expansion of the school system and the feasibility of reaching the levels of expenditure resulting from this expansion.

This introductory chapter, therefore, will give a brief outline of the nature of the main sources of public revenue, of their distribution between the various levels of government, of their growth rate during the last decade as compared with the growth in the Austrian gross national product, of the share of the educational budget in total public expenditure and of the differences in financial strength and in school expenditure between the various regions.

(b) The financing of education in Austria

(i) The division of operational responsibilities for education

Before giving an outline of the division of financial responsibilities in the field of education, it will be good to give a brief sketch of the main bodies involved in providing education, that is: of the division of operational responsibilities.(1)

As can be seen from Table 66 the main responsibility of the municipalities measured in number of pupils is for the general compulsory schools and for roughly one-third of commercial education. The Provinces are primarily responsible for vocational compulsory education. The Federal Government is mainly responsible for running the greater part for secondary general and technical schools, teacher training and all higher education with active participation of the private sector (mainly the Roman Catholic Church) in secondary general and technical education and teacher training.

(ii) The division of financial responsibilities for education

As in other countries the division of operational responsibilities is widely different from that of financial responsibility, as can be seen from a comparison between Tables 66 and 67. Unfortunately no figures are available about expenditure on private schools, nor was it possible to make a reliable estimate of the financial contribution of the private sector. It can safely be assumed, however, that a great part of the expenditure on private schools is included in the public expenditure figures given in Table 67 and that the private financial contribution is much lower than the percentage share of private education (expressed in number of pupils in private schools) would suggest.

Thus more than three quarters of all public expenditure on schools (2) is borne by the Federal Government; municipalities and provinces being responsible for respectively 18 per cent and 6 per cent.

Private schools - confessional (church) schools. The majority of private schools(3) are so called confessional schools belonging to the orders and congregations of the Roman Catholic

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(1) For a more complete outline of the structure of Austrian education see: "Bildungsbericht 1965" (Ministry of Education); Erste Vorausschätzung. OECD-Project (BG669/65 page 2); Teacher study (BG655/65 pages 3-9).

(2) Expenditure on schools does not cover all educational expenditure and the share of the Federal Government is even higher when other items than school expenditure are included: costs of the Ministry, school inspection, Bureau of pedagogic-psychologic services, etc.

(3) Private schools are defined here as schools for which the operational responsibility does not belong to the Federal Government, provinces or municipalities.

Table 66

Number of pupils by type and school level, public and private, 1964-65

Number of pupils 1964/65	Public schools						Private schools				Total	
	Federal government		Provinces		Municipal-ities		Church		Other			
	Number	%	Number	%	Number	%	Number	%	Number	%	Number	%
Compulsory:												
General					749,101	97	22,014	3			771,115	100
Vocational			146,949	100							146,949	100
Secondary:												
General(1)	72,319	84.5			52	-	11,115	13	2,096	2.5	85,582	100
Technical(2)	19,461	74	1,005	4	2,292	8.5	2,245	8.5	1,362	5	26,365	100
Commercial(3)	6,034	39			4,824	31	[illegible]	5	3,779	25	15,426	100
Teacher training(4)	6,849	61			283	2.5	4,058	36			11,190	100
Higher education	51,469	100									51,469	100
Total	156,132	14	147,954	13	756,552	68	40,221	4	7,237	1	1,108,096	100

(1) Schools giving unlimited access to higher education.

(2) Secondary technical and trade schools; technical, trade and arts and crafts schools; schools for training vocational school teachers in domestic and trade subjects, vocational schools for women, schools for higher social occupations and for social workers.

(3) Business academies and business schools.

(4) Secondary grammar schools for future teachers; teacher training institutions; schools for educational assistants and kindergarten and handicraft teachers.

NOTE: In this and subsequent tables, secondary and intermediate technical and commercial schools are grouped together under the heading "secondary". A breakdown is provided, however, in the more detailed tabulations of Section 4 below. See Chapter I, Section A4, for a description of the various school types and levels.

Table 67

Net public current expenditure, 1963, for education by Federal Government, Provinces and Municipalities

	Federal Government		Provinces		Municipalities		Total	
	Million Sch.	%	Million Sch.	%	Million Sch.	%	Million Sch.	%
Compulsory:								
General	1,701.2	70	21.9	1	696.0	29	2,419.1	100
Vocational	81.3	35	149.2	65	-		230.5	100
Secondary:								
General	529.2	100	-	-	-	-	529.2	100
Technical	281.7	68	78.1	13	118.1	19	617.6	100
Commercial	80.3							
Teacher training	59.4							
Higher education	625.6	100	-	-	-	-	625.6	100
Total	3,358.7	76	249.2	6	814.1	18	4,422.0	100

Church. The exact level of expenditure on these schools was not determined for this study. According to spokesmen of the Church, the years before the new subsidy arrangement came into force (1962) was a very difficult period. Since 1962 the financial position of the confessional schools improved greatly, and a beginning was made with the necessary renovation and modernisation of existing institutions, which was long overdue. No plans exist to expand the share of private confessional schools in total enrolments; the existing subsidy system is regarded as only enabling the private sector to hold its own.

According to a Treaty with the Holy See and the 1962 Private School Act, confessional schools receive a subsidy from the Federal Government amounting to the salaries of 60 per cent of their teaching personnel. The remaining 40 per cent of salaries, all non-personnel current expenditure and all capital expenditure is borne by the church. Only a small part of this subsidy takes the form of a money transfer, the greater part being given in the form of "live subsidies", that is in the form of teachers, employed and paid by the State but working in private schools.

It is extremely hazardous to make an estimate of the financial contribution of the church, e.g. based on the number of pupils, assuming costs-per-pupil to be the same as in public schools and subtracting the 60 per cent subsidy. It is likely that the non-subsidised activities in church schools (40 per cent of teachers, auxiliary staff, maintenance etc.) are done by staff members who do not receive a normal salary so that the cost structure of church schools is much lower. If it is nevertheless tried to make an estimate, and it is assumed that costs-per-pupil are the same as in public schools and that the 60 per cent salary subsidy covers 50 per cent of all current expenditure, a rough calculation of the financial contribution of the church to education (current expenditure only) works out at some Sch. 85 million or less than 2 per cent of public school expenditure. As said, in reality the actual amount is most probably lower.

Private non-confessional schools. This small group of private schools does not fall under the 60 per cent subsidy arrangement and is officially independent, there being no legal basis for State subsidies to non-confessional private schools. In reality, however, the major part of expenditure on these schools is borne by the Federal Government both in the form of State paid teachers working in these schools (according to information received from the Ministry of Finance as much as one teacher per class) and by way of substantial grants for equipment and construction. The exact amount of this subsidisation is unknown, but there is every reason to consider these schools as financially belonging to the public sphere. The financial contribution from private sources in this sector must therefore be estimated at much less than what the share in total enrolments (0.65 per cent) would suggest.

Gradually, moreover, many of these non-confessional private schools are taken over by the government. Five of the eleven small, non-confessional secondary general schools, for instance, are planned to be taken over in the course of the coming years, and it is expected that this trend will be continued in the future. In view of its very small and declining importance, the sector will be ignored in the rest of this report.

Municipal schools. Clearly the main responsibility of the municipalities is for primary (general compulsory) schools. They have, moreover, an important share in commercial secondary schools and some share in technical schools and teacher training.

All teachers working in municipal general compulsory schools are fully paid by the central government; only in those cases where the number of teachers exceeds the legal ceiling,(1) the Provinces are obliged to refund the salaries of these extra teachers to the central government. This is only the case in Vienna. The salaries of non-teaching staff are paid by the municipalities, as is all other current expenditure (non-personnel). The municipalities are also responsible for capital expenditure with the assistance of the Provinces, which make considerable contribution to special funds for school construction.

The amount of the financial aid the government gives to other municipal schools (e.g., commercial schools) is not the same in all cases. Practices differ: there is no general legal rule for all forms of aid. By far the greater part of teachers' salaries in these schools is paid out of the central government budget, whereas other current expenditure is normally borne by the municipalities (see Table 68). Apart from this the Federal Government gives substantial grants for the construction of new school buildings.

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(1) Based on the number of pupils; for a more detailed description see Section 4(a).

Table 68

Current school expenditure of the municipalities

In million Schillings

	Expenditure by					
	Federal Government		Provinces		Municipalities	
	Personnel	Other current	Personnel	Other current	Personnel	Other current
Secondary and commercial schools and teacher training	352.3	64.1	16.5	75.3	36.1	153.9
(Number of teachers)	(3[illegible]52)		(212)		(935)	

Province schools. The main responsibility of the provinces is for the vocational compulsory schools, which provide part-time vocational education to young persons in the 14 to 18 years age group. The costs of teachers in these schools are shared by the Federal Government and the provinces equally. In fact the Federal Government pays all teachers' salaries directly and receives a 50 per cent refund from the Länder. This half, other salaries and material current expenditure is paid out of the ordinary budget of the provinces as is a small part of capital expenditure. As in the case of the municipalities the greater part of capital expenditure is paid out of the extraordinary budget with the exception of Vienna, which does not keep an extraordinary account any more.

Federal Government expenditure. Expenditure on State schools and subsidies to municipal, province and private schools, are paid out of the ordinary budget of the Ministry of Education, that means out of the ordinary revenue of the central government without recourse to special means of finance such as earmarked revenue, loans, etc. Ordinary revenue of the Ministry of Education is very small: salary refund of the provinces and municipalities, fees,etc., amounting to only 6½ per cent of gross expenditure; excluding the salary refunds and non-educational items (such as: arts, young people's activities) this percentage is only 3 per cent.

The Ministry's budget contains a small part of capital expenditure: replacement of equipment and furniture, and investment grants to private and local schools. But the most important part of capital expenditure: the construction of new school buildings, is outside the budget of the Ministry of Education and financed in the ordinary operations of the Ministry of Public Works (now: "Bundesministerium für Bauten und Technik").

Table 69

Total public expenditure on education

(Net expenditure figures in million Schillings)

	1956					1963				
	Federal Government	Provinces	Municipalities	Total	%	Federal Government	Provinces	Municipalities	Total	%
General expenditure										
Ministry of Education	15.3	-	-	15.3	0.5	30.2	-	-	30.2	0.5
School inspection, etc	29.0	-	-	29.0	1.0	50.1	-	-	50.1	0.9
Pedag.-psych.bureau	1.1	-	-	1.1	-	3.0	-	-	3.0	0.1
Higher education(1)	236.7	-	-	236.7	8.3	625.6	-	-	625.6	10.8
Secondary:										
General schools	277.4	-	-	277.4	9.7	529.2	-	-	529.2	9.2
Commercial schools	35.3	-	-	35.3	1.2	80.3	-	-	80.3	1.4
Technical schools	139.6	-	-	139.6	4.9	281.7	-	-	281.7	4.8
Teacher training	27.6	-	-	27.6	1.0	59.4	-	-	59.4	1.0
Compulsory schools:										
General	1,092.7	33.6(2)	333.4	1,459.7	51.0	1,701.2	21.9(3)	696.0	2,419.1	41.9
Vocational	43.4	74.5	-	117.9	4.1	81.3	167.5	-	248.8	4.4
Unspecified school expenditures	-	21.7	40.4	62.1	2.2	-	77.9	146.9	224.8	3.9
Other educational expenditures(4)	4.5	-	-	4.5	0.2	18.0	-	-	18.0	0.3
Non-educational items(5)	154.4	-	-	154.4	5.4	330.4	-	-	330.4	5.7
Total budget of Ministry of Education	2,057.0					3,790.4				
Capital expenditure										
Ministry of Commerce	84.3	-	-	84.3	2.9	259.1	-	-	259.1	4.5
Provinces and Municipalities (6)	-	14.7	203.2	217.9	7.6	-	63.5	546.3	609.8	10.6
Total	2,141.3	144.5	577.0	2,862.8	100	4,049.5	330.8	1,389.2	5,769.5	100.0
Trend (1956 = 100)	100	100	100	100		189	229	241	202	
% of GNP				2.4					2.9	

(1) Including Art Academies.
(2) Including 29.2 million Schillings expenditure of Vienna.
(3) Including 58.9 million Schillings expenditure of Vienna.
(4) Institutes for the blind and deaf and dumb boarding schools, etc.
(5) Scientific institutes, libraries, youth activities, sport and the whole sector of Art (excluding Art Academies).
(6) Extraordinary expenditure.

The policy with respect to new school construction is a joint responsibility of the Ministry of Public Works, which decides the volume of construction for each year, and the Ministry of Education, which sets the priorities and decides on the location and types of schools. At present school construction of the Federal Government amounts to some Sch. 500 - 600 million a year, which figure is said to be limited, not so much by the lack of funds but by the limited capacity of the building industry.

(iii) The structure of government income

Before tracing the recent evolution in the volume of total public expenditure, and of expenditure on education, it will be useful to analyse the income structure of the public sector. The following tables deal with all levels of government.

Table 70

Income structure of total public sector

(All levels of government)

(Between brackets: share of the central government in total income)

Billion Austrian Schillings

	1962	1963	1964	1965	% Increase (1962-1965)
Direct taxes					
Private households	16.9 (9.9)	18.3 (11.1)	20.9 (12.7)	24.5 (15.0)	
Companies	4.8 (3.8)	5.0 (3.9)	5.4 (4.2)	6.0 (4.6)	
Total	21.7 (13.7)	23.3 (15.0)	26.3 (16.9)	30.5 (19.6)	40 (43)
Indirect taxes	28.2 (19.9)	30.4 (21.5)	33.9 (24.1)	37.0 (26.3)	31 (32)
Social insurance	13.1	14.0	15.9	17.8	36
Transfers from abroad . . .	0.9 (0.9)	0.1 (0.1)	0.5 (0.5)	0.5 (0.5)	
Income from property and enterprise	1.7 (1.2)	1.6 (1.0)	1.2 (0.5)	1.1 (0.3)	
Total current income	65.6 (35.7)	69.4 (37.6)	77.8 (42.0)	86.9 (46.7)	32 (31)

Table 71

Direct and indirect taxes and social insurance revenue compared to GNP 1955 to 1965

Billion Austrian Schillings

	Gross National Product (1)	Taxes plus Social Insurance (2)	(2) as % of (1) (3)
1955	107.6	31.5	29.3
1956	118.0	35.8	30.3
1957	130.8	40.4	30.9
1958	136.2	42.4	31.1
1959	143.3	44.2	30.9
1960	161.3	49.3	30.6
1961	177.9	57.9	32.9
1962	186.9	63.0	33.7
1963	199.3	67.7	34.0
1964	219.1	76.1	34.7
1965	239.0	85.3	35.7
% increase	122	171	-

Except for the years 1959/60 the share of the main components of government revenue in gross national product has an upward trend, the elasticity coefficient for the whole of the period being 1.4. It is interesting to note that this coefficient for the first five years (1955-1960) was only 1.13 but for the last five years (1960-1965) was 1.51.(1)

The composition of Federal Government revenue alone is given in the following table.

Table 72

Federal Government composition of government revenue, 1963

(In million Austrian Schillings)

Direct taxes

Income tax	8,577		
Company tax	2,182		
Property tax	896		
Business tax (2)	3,637		
Other direct	2,691		
		17,983	32.7%

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(1) These (and also the following) elasticity coefficients have only a limited value since no adjustments could be made for deliberate changes in the tax structure in the past.

(2) "Gewerbesteuer", tax paid for carrying on a trade or industry and based on the firm's capital and profits.

(Table 72 continued)

Indirect taxes			
Turnover tax	11,124		
Customs duties	3,599		
Tobacco excise	2,178		
Oil excise	2,810		
Stamp duties	1,861		
Other indirect	3,623		
		25,295	45.8%
Total taxes		43,178	78.5%
Transfers to provinces and municipalities		14,303	26.0%
Remainder		28,875	52.5%
Other tax-like income		5,664	10.3%
Transfers from provinces and municipalities		452	0.8%
Transfers from abroad		45	0.1%
Rents		376	0.7%
Income from property		977	1.8%
Transfer items		2,477	4.5%
Other revenue		2,745	5.0%
Current revenue		41,611	75.7%
Income from monopolies and state enterprises		13,337	24.2%
Total ordinary revenue		54,948	99.9%
Extraordinary revenue		35	0.1%
Total revenue		54,983	100.0%
Ordinary expenditure		56,010	

(iv) Increases in the total budget and in educational expenditure over the past decade

(a) Federal Government

Between 1955 and 1965 the sum total of the Federal Government ordinary budget increased from 23,000 million Austrian Schillings to 63,800 million Austrian Schillings or by 177 per cent as compared with an increase in Gross National Product of 122 per cent over the same period (elasticity 1.45).

The share of the budget of the Ministry of Education in the total ordinary budget did not increase at all between 1955 and 1963, but fluctuated between 6.9 per cent and 7.4 per cent. In the two years since then, however, it rose sharply from 7.2 per cent to 8.2 per cent.

Table 73

Education budget (Ministry of Education) as a share of the total Federal budget 1955-1967

(In billion Austrian Schillings)

	Total ordinary budget (1)	Budget Ministry of Education (2)	(2) as a % of (1) (3)
1955	23.0	1.7	7.2
1956	27.2	2.0	7.3
1957	31.8	2.2	7.0
1958	37.3	2.6	6.9
1959	37.5	2.7	7.3
1960	41.1	3.0	7.4
1961	45.1	3.2	7.2
1962	52.5	3.7	7.1
1963	56.5	4.1	7.2
1964	56.8	4.4	7.7
1965	63.8	5.2	8.2
1966	68.2	6.2	9.1
1967	75.0	6.9	9.2
% increase . .	326	406	

It should be mentioned here that the budget of the Ministry of Education does not reflect the precise amount of educational expenditure of the central government. The budget does not include agricultural education and other educational activities of other ministries, nor capital expenditure on new school buildings, nor pensions of former teachers. On the other hand, the budget includes the whole sector of arts, a number of non-educational scientific institutions and the field of young people's activities.

(b) Provinces and municipalities

Figures of the expenditure of the provinces and municipalities were only available up to 1963. As can be seen from Table 74, the ordinary accounts of the municipalities, Vienna(1) and the provinces increased by 117 per cent, 122 per cent and 143 per cent, respectively, between 1955 and 1963. These figures can be compared with an increase of 85 per cent in Gross National Product and 146 per cent in the central government ordinary budget over the same period. The rise in the ordinary budgets of the regional and local authorities was thus much faster than the increase in Gross National Product, elasticity ratios for the whole of the period being: municipalities 1.38, Vienna 1.42 and provinces 1.7.

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(1) Vienna is both a province and a municipality.

Table 74

Educational expenditure as a proportion of budget: municipalities, Vienna and provinces 1955 to 1963

(In million Austrian Schillings)

	Municipalities			Vienna			Provinces		
	Ordinary account			Ordinary account			Ordinary account		
	Total	Education	%	Total	Education	%	Total	Education	%
1955	3,755	333	8.9	3,316	110	3.3	3,305	106	3.2
1956	4,133	351	8.5	3,647	128	3.5	3,906	118	3.0
1957	4,773	410	8.6	4,233	147	3.5	4,591	149	3.2
1958	5,314	425	8.0	4,746	166	3.5	5,219	145	2.8
1959	5,396	499	9.2	5,194	155	3.0	5,226	138	2.6
1960	5,831	531	9.1	5,333	166	3.1	5,692	167	2.9
1961	6,546	600	9.2	6,569	181	2.8	6,516	183	2.8
1962	7,416	663	8.9	6,988	217	3.1	7,374	221	3.0
1963	8,147	733	9.0	7,351	250	3.4	8,044	259	3.2
Increase %	+ 117	+ 120	-	+ 122	+ 127	-	+ 143	+ 144	-

As can be seen from the figures given above, the share of education in the total budget of the provinces and municipalities did not change much between 1955 and 1963. As we have seen, the same applies for the Federal budget during the same period (the considerable increase in educational expenditure being achieved in 1964 and 1965). The question may be investigated whether the rapid increase in Federal educational expenditure in 1964 and 1965 is matched by a corresponding increase in school outlay of the provinces and municipalities.

No time was found to go deeply into a comparison of the financial strength of the provinces and municipalities as compared with that of the Federal Government. Although part of the main sources of public revenue is reserved for the Federal Government,(1) the provinces and municipalities do share to a considerable extent in part of the income tax, turnover tax and other important tax revenues.(2) In addition there are a number of exclusively local taxes such as land and property tax, payroll tax, part of the business tax, tax on food and beverages.(3) There are, moreover, considerable transfers from the Federal

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(1) Ausschlieblich Bundesabgaben 1963, A.Sch. 26,186 million.

(2) Gemeinschaftliche Abgaben 1963, A.Sch.18,078 million of which Federal Government Sch. 8,263 million, Länder Sch. 4,236 million and municipalities Sch.5,111 million.

(3) Länder (gemeinde) abgaben 1963, A. Sch. 5,048 million.

Government to the provinces and municipalities;(1) "upward" transfers (e.g. from municipalities to the Federal Government) are of minor importance.(2)

(v) Regional inequalities in educational expenditure

To mitigate the considerable regional differences in fiscal capacity and to strengthen the financial position of the weaker provinces and municipalities, there is a complicated system of equalisation, the technicalities of which will not be described here.

In spite of this, regional differences in public expenditure, and consequently of school expenditure, appear to be very high. This impression, which is quantified in the following table, was confirmed by information received from many expert sources, who reported considerable inequalities of educational opportunities and standards throughout the country.

Obviously there is no perfect correlation between fiscal capacity and public expenditure per head of population on the one hand, and educational expenditure per child in the compulsory age group on the other hand - the share of education in the total budgets differ too much. Nevertheless, the figures in Table 75 demonstrate the considerable difference in expenditure per child and confirm, in a more general way, the rule that the richer communities spend much more on education than the poorer regions. Leaving aside the rather extreme cases of Vienna and Vorarlberg, the extremes are 75 per cent and 113 per cent of the national average, a ratio of 2:3.

There seems to be every reason, perhaps as part of a "second stage" of Austrian planning activities, to investigate the problem of regional inequalities more thoroughly. It would be very interesting to know, for example, in how far the differences in educational expenditure, reflected in Table 75, should be adjusted for differences in price levels between the various regions(3) and in how far these differences are of a purely financial nature (i.e., due to shortage of funds), and in how far they merely reflect bottlenecks in the supply of real resources (regional shortages of teachers, limitations of the building industry, etc.). On the basis of this investigation suggestions could then be formulated for a more flexible policy of subsidies and grants, deliberately aiming at reducing the regional difference in educational opportunities.

2. Projection of public expenditure on education in 1970 and 1975(4)

(a) Introduction

The projection of educational expenditure in Austria for the years 1970 and 1975, given below, is a double projection.

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(1) In 1963: A. Sch. 3,573 million of which Sch. 1,670 million for schools (the system of these education grants will be described later).

(2) In 1963: A. Sch. 494 million of which Sch. 21.8 million for schools.

(3) Since teachers' salaries are the main component of current outlay and these salaries are standardised for the whole country, difference in price level can only play a minor role in explaining different levels of expenditure.

(4) A full statement of these projections is contained in the technical annex to this Chapter at the back of the book.

Table 75

Regional differences in fiscal capacity, revenue and expenditure on schools in Austria, 1963

	National average	Burgen-land	Kärnten	Lower Austria	Upper Austria	Salzburg	Steier-mark	Tyrol	Vorarl-berg	Vienna
1. Fiscal capacity (excl. municipal income) in Schillings per capita. .	813	675	780	776	778	978	800	946	988	-
Fiscal capacity (excl. municipal income) in % of average	100	84	96	95	96	122	98	118	123	-
2. Ordinary budget (provinces excl. municipal expenditure) Schillings per capita. .	1,477	1,192	1,528	1,275	1,487	1,707	1,577	1,677	1,615	-
Ordinary budget (provinces excl. municipal expenditure) in % of average	100	81	103	86	101	116	107	114	109	-
3. Ordinary budget (provinces and municipalities) in Schillings per capita	3,326	2,028	2,928	2,590	3,045	3,800	2,912	3,553	4,019	4,516
Ordinary budget (provinces and municipalities) in % of average .	100	61	88	78	92	114	88	107	121	136
4. Ordinary expenditure on schools (provinces and municipalities) in Schillings per child in compulsory school age	1,567	1,170	1,233	1,263	1,518	1,767	1,193	1,333	3,474	2,537(1)
Ordinary expenditure on schools (provinces and municipalities) in % of average	100	75	79	81	97	113	76	85	222	162

(1) The expenditure figure for Vienna underestimates the magnitude of local educational efforts; in contrast to the other provinces, Viennese pupils in the age group 10-14 are generally no longer in compulsory schools (financial responsibility of the municipalities) but in the so called "Höhere Schule" (financed by the Federal Government).

The first projection, made in August 1965, was only a preliminary projection which was based on what had to be considered as a minimum estimate of future school enrolments and the full implementation of the 1962 School Act before this Act was amended in 1965. In the absence of other information, the financial calculations were built on the projected number of pupils and teachers, given in the First Assessment of Dr. Haupt (from the Austrian Central Statistical Bureau), who includes the demographic trend and the effects of the 1962 School Act in his projections, but does not take into account the rising social demand for education and the higher demand for skilled manpower resulting from the development of the Austrian economy. Consequently, the enrolment estimates form a rather conservative projection of school developments during the coming ten years. Even so the assumption that the 1962 School Act would be fully implemented and a considerable improvement in the pupil-teacher ratio would be attained, leads to very high projections of the future number of teachers in compulsory schools and, consequently, to a considerable increase in estimated future expenditure levels.

A summary of the results of this first, preliminary, projection is given in Table 76 at the end of this chapter.

The second cost projection was made in February 1966 and based on the less conservative Second Assessment of School enrolments made by the Planning Bureau of the Austrian Ministry of Education. Taking into consideration the rising social demand for education, the Planning Bureau arrived at slightly lower enrolment estimates for general compulsory schools but at greatly increased estimates for secondary and higher education. This in itself would, no doubt, have resulted in much higher cost estimates.

However, in the course of 1965 the Austrian parliament accepted an amendment to the 1962 School Act, postponing the improvement of the pupil/classroom ratio. In view of the acute shortage of teachers it became apparent already last year that the high number of compulsory school teachers, projected in Dr. Haupt's First Assessment, formed an unattainable goal. Although, the improvement of the pupil/teacher ratio is certainly considered desirable, it was felt that for the purpose of our cost projection it would not be very realistic to expect an improvement which the Austrian parliament considers impossible to attain at present. Consequently, the ratio between pupils and teachers was assumed to remain at its level of 1963/64. This factor resulted in a substantially lower projection of compulsory school expenditure in the second estimate, which explains that this estimate (although based on less conservative enrolment projections) is not very much higher than the first.

A summary of the results of this second, financial, estimate is given in Table 77. More details, for each level and type of school, are given in the Annex to this Chapter at the back of the book.

(b) The statistical basis for the projection

A reliable projection of educational expenditure in the future, obviously, should be based on a careful analysis of trends in expenditure figures during a number of years in the past. Only in this way is it possible to discover the main determinants of costs and expenditure and to take full account of these determining factors for future outlay projections. Unfortunately, the Austrian school and financial statistics did not enable us to make a very careful analysis of past expenditure trends in the relatively short time of a few weeks that were available to finish the cost estimate. Since no previous investigations into the level and composition of educational expenditure in Austria existed, much time had to be spent on spade work such as finding the sources of information and collecting and grouping of figures. A far greater obstacle was the lack or inaccessibility of sufficiently detailed information.

There were three major gaps in the statistical data:

(i) Expenditure figures of the provinces and municipalities

Information about the educational expenditure of the Federal Government, given in the published accounts of the Ministry of Education (Bundesvoranschläge und - Rechnungsabschlüsse) is sufficiently detailed (per level and type of schools and nature of expenditure) but does not include capital expenditure on new buildings and renovations. The financial information provided by the provinces and municipalities, however (which is given in the Gebarungsübersichten von Ländern und Gemeinden) is clearly inadequate:

- The breakdown of expenditure figures into types of schools is imperfect, part of the figures being unspecified;
- The breakdown into nature of expenditure is not very informative; ordinary personnel expenditure does not include salary transfers to the State; ordinary material expenditure includes salary transfers and part of capital expenditure (unknown how much); extraordinary expenditure is unspecified and lacking for Vienna, etc.;
- Figures for some of the provinces are left out;
- Expenditure of Vienna is included in municipal expenditure; in view of the exceptional position of Vienna, however, it would be highly desirable to keep the expenditure of Vienna separated.

(ii) Capital expenditure figures

Capital expenditure on new schools is not included in the budget of the Ministry of Education but in that of the Ministry of Public Works; the few figures that could be found were contradictory and unspecified (as to type and level of schools and nature of expenditure). Expenditure on school construction by the provinces and municipalities is virtually lacking, this expenditure being included in ordinary material expenditure (ordentlicher Sachaufwand) and in extraordinary expenditure (ausserordentliche Ausgaben).

(iii) The linkage between financial and school statistics

Clearly, the financial figures obtain their real significance from a comparison with the non-financial school statistics (number of pupils, teachers, classrooms, schools, etc.) Since the compilation of these two groups of data is uncoordinated such a comparison is hardly possible.

After spending a few weeks on attempts to obtain a clear picture of the system of Austrian school financing and of the level and nature of expenditure, it was felt that we should either spend considerably more time on data collection and analysis or abandon any attempt aiming at perfection and simply use the available data. In view of the lack of time available for this work, the second alternative was chosen and, consequently, the following figures give only a very rough global estimate of future expenditure. There is, however, much scope for further research in this field, and it would be desirable if the Austrian team could include a careful analysis of educational expenditure in its future programme of work.

(c) The methods used in projecting the different types of expenditure

The projection of public educational expenditure in 1970 and 1975, given below, is based on the main assumption that the system of school financing (distribution of financial responsibilities, subsidisation of private schools, etc.) will remain unchanged and no major changes in methods of instruction will upset the existing cost structure.

1963 being the last year for which financial data of all public authorities were available, this year was chosen as "base year".(1) Ignoring the inflation factor for the future, all estimates given for 1970 and 1975 are in constant 1963 prices. To compare current outlay figures in future years with our estimates, our projection figures should, therefore, be increased by the percentage increase in the general price level since 1963.

Where possible the expenditure figures for 1963 were compared with those for 1956 (the year after the 1955 State Treaty, which marked a return to more normal political conditions) and some interesting conclusions could be drawn from this comparison, but no use was made of the 1956-1963 expenditure trend to predict future expenditure because (i) no proper analysis of this trend could be made (see above), (ii) it is doubtful to what extent this past trend gives an indication of what is desirable or normative for the future.

(i) Personnel expenditure

It was very interesting to find that personnel expenditure per teacher (2) increased more rapidly between 1956 and 1963 than the nominal salaries registered in the official salary scales for teachers,(3) but stayed considerably behind the increase in gross national product per head of the employed population during the same period.

The first discrepancy (between personnel expenditure and nominal salary rates) can possibly be explained by a number of factors, such as:

- Increases in social and other fringe benefits not reflected in salary rates;
- Increases in the proportion of non-teaching staff, not included in the number of teachers;
- Changes in the age structure and sex composition of the staff;
- Changes in the proportion of part-time teachers and in qualifications;
- Important increases in extra teaching hours (overtime).

As said before, time and data were lacking to investigate the influence of these factors in the past and for the purpose of projection of future expenditure they could not be taken into account. Any future cost study should certainly go deeper into these problems.

The second discrepancy (between personnel expenditure and gross national product per capita) seems to confirm what was already known before: that teachers' remunerations stayed far behind the rise in the average income per head of the employed population. Against a (nominal) rise in gross national product per head of the employed population of 69 per cent, salary rates of compulsory and secondary school teachers increased by 28 per cent - 46 per cent in the period 1956-1963. The difference is even greater when these nominal increases are converted into real increases by deflating the figures for the increase in the cost-of-living index (24½ per cent): real rise in gross national product per capita 36 per cent, real rise in teachers' salaries only 3 per cent - 17 per cent.

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(1) An exception was made for higher education; budget appropriations for universities and students rose so sharply between 1963 and 1965 that it would have been unrealistic to base our estimate on the low 1963 figures. The 1965 budget figures were used instead as a basis. For the sake of uniformity they were deflated by the inflation factor 1963-1965 and are, consequently, also expressed in constant 1963 prices.

(2) "Ativitätsaufwand" of the Federal Government, provinces and municipalities combined, divided by the number of teachers.

(3) See Annex to Chapter V for the development of teachers' salaries under the various school types.

To project the future magnitude of personnel expenditure, it has been assumed that teachers' real salaries will increase at the same rate as the real increase in gross national product per capita. Of course this assumption is more a policy recommendation than a prediction of what is likely to happen, in view of past experience. It is, nevertheless, a very moderate assumption - it keeps teachers' salaries in line with the rest of the economy (which seems to be a first step to solve the problem of teacher shortage) but does nothing to reduce the arrears, accumulated in the past.

According to Dr. Steindl's estimates,(1) gross national product per head of the employed population, in constant 1954 prices, is expected to rise from approximately Sch. 37,500 in 1961 to Sch. 55,000 in 1970 and Sch. 68,000 in 1975 or, expressed in percentages, from 100 to 136 and 168 respectively. Consequently, teachers' salaries were projected to rise at the same rate.

The other main determinant of personnel expenditure is, of course, the number of teachers. In the first estimate we used the following method: in those cases where Dr. Haupt's Erste Vorausschätzung contained a calculation of teachers' requirements, his figures were taken as a basis for our projections. In the other cases, we have assumed a constant pupil/teacher ratio, in other words we assumed that the size of the staff will rise at the same rate as the number of pupils. This, of course, not only implies that foreseen future shortage of teachers will be solved, but also that the proportion of those private teachers who are not paid by the government, will remain constant. The factors mentioned above under (a), (b), (c) and (d) were, moreover, left out completely.

In the second estimate we assumed, for all levels of education, that the number of teachers and other staff members would rise at the same rate as the number of pupils.

One great exception was made here for higher education. The staff position at the Austrian universities showed an extremely rapid deterioration between 1955 and 1963; the ratio between students and teaching staff (Lehrpersonen) more than doubled from 6.27 in 1955/56 to 13.07 in 1963 (excluding arts).(2) Basing our cost estimate on the existing undesirable ratio would be a highly unsatisfactory and pessimistic procedure that would under-estimate both the urgency of the problem and the government's determination to improve the position, which became already apparent in the greatly increased budget appropriations and the slight improvement in the staff position during the years since 1963. It is assumed here, therefore, that attempts would be made to bring the student/staff ratio back to the 1955/56 level, that is (including arts) from about 11 in 1965 to, say, 8.5 in 1970 and 6 in 1975. For the first estimate the estimated number of students were taken over from Dr. Haupt's First Assessment, although his estimate seems to be very pessimistic.(3) The second estimate is based on considerably higher numbers of students.

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(1) See Annex to Chapter III, Table 47.

(2) Including staff and students at the Art Academies, the number of students per staff member rose from 6.12 to 11.84 in the same period.

(3) Dr. Haupt foresees an increase in the number of students between 1965 and 1970 of only 5.5 per cent and a decrease of more than 1 per cent between 1970 and 1975 (compared with an increase during the period 1955-1964 of 144 per cent). His forecast, moreover, does not show any shifts between major groups of faculties (e.g. towards science and technology). Any revision of this forecast will, of course, greatly affect our cost projection.

(ii) Other current expenditure

The group of non-personnel current expenses were expressed as a percentage of all current expenditure (including personnel expenditure) both for 1956 and 1963. Since there is not much stability in these percentages, we could not simply base our projection on the existing proportions. Where known errors existed in the material sphere or where percentages differed greatly with what is considered normal in other countries, the percentages were adjusted. In most cases this was, of course, a matter of judgement.

For higher education a number of very important items were left out of this group, because their development trend is so different that it was felt that they should be treated separately. These items are: scholarships (and other social measures), investment grants for students' homes, investment in equipment (Anlagen) and expenditure (both capital and current) on university hospitals. Expenditure on these items increased extremely rapidly in the last few years (their total doubled between 1963 and 1965), without any direct relation to the number of students and staff. When trying to project the future magnitude of these items, we found that a proper basis for a projection was lacking. To leave them out altogether would make our end figures incomparable with past expenditure figures. To avoid this we made a very arbitrary estimate of what future expenditure on these items could be(1) - a pure guess, which is open to criticism and revision.

(iii) Capital expenditure

Our estimate of the amount of investments in new school building and renovations is based on figures obtained from Dr. Schlesinger (for compulsory schools) and on Dr. Loicht's Report of the quantitative development of classroom requirements (in all types of secondary schools).

The method used for our calculations is a very simple one:

- Expansion demand: we subtracted Dr. Loicht's figures of the existing stock of classrooms in 1964/65 from his figures of the requirements in 1974/75 and multiplied the resulting need for new classrooms by the average cost per classroom, given in his report.
- Replacement demand: we assumed that at least 2 per cent of the existing stock of classrooms had to be replaced annually, either by complete new construction (1 per cent) or by renovation at roughly 10 per cent of the cost of a new building (1 per cent).

The sum of (a) and (b) gives the total amount of school construction (again: in constant prices) for the 10 year period 1964/65 - 1974/75. To calculate the annual amount for 1970 and 1975, this total sum was spread over ten years by assuming it to go up along an arithmetic trend, starting from the present level of school construction of about Sch. 500 million.

Capital expenditure on universities had to be estimated on the basis of data from the Ministry since nothing was known about the shortage of space and the cost of construction at this level; any calculation here would have been pure guesswork.(1)

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(1) The exact procedure is described in Section 4(f) below.

(iv) Teacher training colleges

For one type of school - the new type of teacher training college ("Pädagogische Akademien") - no financial information existed because these schools do not yet exist but will start operation at the beginning of the school year 1966/67.(2) On the basis of information obtained from the Ministry the probable size and composition of the staff of these schools could be estimated. This enabled us to make a calculation of the amount of personnel expenditure and (as a percentage) the order of magnitude of other current expenditure. It was also possible to estimate the capital outlay necessary for the construction of these schools (see Section 4(h)).

(v) Other expenditure

The budget and accounts of the Ministry of Education contain a number of other expenditure items not directly for schools. Part of them certainly fall within the definition of educational expenditure (costs of the Ministry, school inspection, pedagogical centres); part is certainly non-educational (libraries, arts, sport, etc.). We did not make a separate projection of these items but simply assumed that their share in the total budget would remain the same.

(vi) Unspecified expenditure of the provinces and municipalities.

Part of the expenditure figures derived from the "Gebarungsübersichten der Länder und Gemeinden" is unspecified, that is: not broken down by type of school. From the distribution of operational responsibilities, shown in Chapter II, it is roughly known on which types of school these amounts have been spent: technical and commercial schools and training institutes for infant school teachers and educational assistants.

To make at least a global projection of these unspecified amounts of expenditure it is assumed that they will rise at the same rate as Federal Government expenditure for the same types of school. This method is worked out in Section 4(g).

(d) Summary of the results

A detailed description of how the above-mentioned method was applied to actual figures, for each type and level of education, is given in the appendices at the end of this report. A summary of the outcome of the projections is given in Tables 76 (first estimate) and 77 (second estimate) below.

According to the first estimate total expenditure(3) (in constant 1963 prices) is expected to increase from Sch. 5,710 million in 1963 to Sch. 14,862 million in 1975, or to 260 per cent of its present amount. Since the Gross National Product is expected to increase by about 64 per cent, the share of education in Gross National Product should consequently go up from 2.9 per cent to 4.5 per cent.

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(1) In many respects our projection of expenditure on universities is not very satisfactory; if time could be found, it would be worthwhile to go deeper into the cost structure of Austrian universities and into the existing arrears in staff, equipment and space, in a later stage of the work.

(2) See Chapter I, Section A4.

(3) It should be kept in mind that the total amount of public expenditure does not cover the concept of "education expenditure" very precisely. It includes a few non-educational items (in 1963 Sch. 330 m. or 6 per cent) but excludes educational institutions run by other ministries (agriculture Sch. 72.9 m., technical schools, Sch.110.3 m.) and teachers' pensions. We do not expect, however, that after making these corrections, the total amounts will differ much from those given in this chapter.

The second estimate resulted in slightly lower figures for 1970 but in higher figures for 1975. According to this estimate total expenditure will increase to Sch. 15,507 million in 1975 or 272 per cent of the present amount, which will represent approximately 4.8 per cent of Gross National Product. This percentage, when compared with corresponding figures for other countries, is not unusual.

The increase in public expenditure is heaviest in the central government sector: Federal Government expenditure is expected to triple whereas the expenditure of the provinces and municipalities will hardly double. The major part of Federal Government expenditure is, of course, the budget of the Ministry of Education which can be expected to grow from Sch. 3,790 million to Sch. 11,432 million, or to 302 per cent of its present level. This increase by 202 per cent in 12 years compares with an increase of 49 per cent in the 7 years between 1956 and 1963 and of 17 per cent in the two years between 1963 and 1965 (all in constant prices).

How far are the above-mentioned figures realistic? How far is an increase in public expenditure to the above-mentioned extent feasible? Will it be possible to raise the necessary funds without major changes in the system of financing education?

We shall try to give an answer to these questions in the following chapter in which a tentative projection will be made of the growth of the existing sources of revenue and some methods will be discussed to tap new sources of finance.

3. Sources of revenue

(a) Introduction

Since the ordinary budgets of the Federal, regional and local governments are by far the most important sources of revenue used for education and will undoubtedly remain so in the future, we have concentrated our efforts to project the future magnitude of available funds on the public sector and tried to investigate to what extent ordinary revenue of the government can be expected to grow. Only in the last paragraphs of this chapter have we pointed out some ways of increasing the contribution from some private sources, which might be relevant to the Austrian situation.

Predicting the increase in the main sources of government revenue is a rather hazardous task without knowing a good deal more about the relation between the national product and tax revenue and about the government's future fiscal policy. Information on these points is not exactly abundant in Austria and, in fact, the only thing we knew was the past trend in Gross National Product and government revenue and expenditure since the early fifties. Using Dr. Steindl's projection of the future Gross National Product as a basis we could not do much more than simply extrapolate the trend in the relationship between Gross National Product and the public budgets over the period 1955-1965 into the future (1965-1975).

As can be seen from Table 71 the yield of taxes and social insurance, at all levels of government, increased by 171 per cent in the ten years between 1955-1965, compared with an increase of 122 per cent in Gross National Product during the corresponding period. In other words every increase of 1 per cent in Gross National Product resulted in an increase of the main components of government revenue of 1.4 per cent.

Table 76

First projection of public expenditure on education 1963-1975 (in constant 1963 prices)

(Net expenditure in million Schillings)

	1963				1970				1975			
	Federal Government	Provinces	Municipalities	Total	Federal Government	Provinces	Municipalities	Total	Federal Government	Provinces	Municipalities	Total
General expenditure												
Ministry of Education	30.2	-	-	30.2	168.9	-	-	168.9	237.8	-	-	237.8
School inspection, etc. . . .	50.1	-	-	50.1								
Pedag.-psych. services . . .	3.0	-	-	3.0								
Higher education(1)	625.6	-	-	625.6	1,523.4	-	-	1,523.4	2,305.5	-	-	2,305.5
Secondary schools												
General	529.2	-	-	529.2	954.9	-	-	954.9	1,496.6	-	-	1,496.6
Commercial	80.3	-	-	80.3	123.6	-	-	123.6	207.4	-	-	207.4
Technical	281.7	-	-	281.7	416.9	-	-	416.9	614.7	-	-	614.7
Teacher training	59.4	-	-	59.4	139.5	-	-	139.5	215.1	-	-	215.1
New type of teacher training college	-	-	-	-	148.5	-	-	148.5	183.4	-	-	183.4
Compulsory schools												
General	1,701.2	21.9	696.0	2,419.1	3,385.8	36.9	1,097.6	4,520.3	4,395.7	45.6	1,362.8	5,804.1
Vocational	81.3	167.5	-	248.8	107.5	197.3	-	304.8	158.5	291.8	-	450.3
Unspecified school expenditure(2)	-	77.9	146.9	224.8	-	125.4	236.5	361.9	-	191.6	361.4	553.5
Other educational expenditure(3)	18.0	-	-	18.0	36.5	-	-	36.5	51.4	-	-	51.4
Non-educational items(4) . . .	330.4	-	-	330.4	669.3	-	-	669.3	942.6	-	-	942.6
Total budget Ministry of Education	3,790.4				7,674.8				10,808.7			
Capital expenditure												
Ministry of Commerce	259.1	-	-	259.1	(750.0)	-	-	(750.0)	(1,000.0)	-	-	(1,000.0)
Provinces and municipalities(5)	-	63.5	486.9	550.4		(80.0)	(620.0)	(700.0)		(100.0)	(700.0)	(800.0)
Total	4,049.5	330.8	1,329.8	5,710.1	8,424.8	439.6	1,954.1	10,818.5	11,808.7	629.0	2,424.2	14,861.9
(Trend)	(100)	(100)	(100)	(100)	(208)	(133)	(147)	(189)	(292)	(190)	(182)	(260)

(1) Including Art Academies.

(2) Current expenditure for schools by provinces and municipalities not broken down into type of school.

(3) Institutes for the blind and deaf and dumb, boarding schools, etc.

(4) Scientific Institutes, libraries, youth activities, sport and the whole sector of Art (excluding the Art Academies).

(5) Extraordinary expenditure.

Table 77

Second projection of public expenditure on education 1963-1975 (in constant 1963 prices)

(Net expenditure in million Schillings)

	1963				1970				1975			
	Federal Govern-ment	Pro-vinces	Munici-palities	Total	Federal Govern-ment	Pro-vinces	Munici-palities	Total	Federal Govern-ment	Pro-vinces	Munici-palities	Total
General expenditure												
Ministry of Education	30.2	-	-	30.2								
School inspection, etc. . . .	50.1	-	-	50.1	167.0	-	-	167.0	251.5	-	-	251.5
Pedag.-psychol. services . .	3.0	-	-	3.0								
Higher education(1)	625.6	-	-	625.6	1,587.7	-	-	1,587.7	2,687.4	-	-	2,687.4
Secondary schools												
General	529.2	-	-	529.2	1,083.5	-	-	1,083.5	1,832.4	-	-	1,832.4
Commercial	80.3	-	-	80.3	170.2	-	-	170.2	291.5	-	-	291.5
Technical	281.7	-	-	281.7	540.7	-	-	540.7	932.7	-	-	932.7
Teacher training	59.4	-	-	59.4	133.0	-	-	133.0	214.4	-	-	214.4
New type of teacher training college	-	-	-	-	148.5	-	-	148.5	183.4	-	-	183.4
Compulsory schools												
General	1,701.2	21.9	696.0	2,419.1	2,962.6	32.3	961.2	3,956.1	3,837.8	39.8	1,189.9	5,067.5
Vocational	81.3	167.5	-	248.8	102.8	189.3	-	292.1	151.8	278.9	-	430.7
Unspecified school expenditure(2)	-	77.9	146.9	224.8	-	155.8	293.8	449.6	-	265.6	500.9	766.5
Other educational expenditure(3)	18.0	-	-	18.0	36.1	-	-	36.1	54.4	-	-	54.4
Non educational items(4) . . .	330.4	-	-	330.4	660.6	-	-	660.6	994.5	-	-	994.5
Total budget Ministry of Education	3,790.4				7,592.7				11,431.8			
Capital expenditure												
Ministry of Commerce	259.1	-	-	259.1	(750.0)	-	-	(750.0)	(1,000.0)	-	-	(1,000.0)
Provinces and municipalities(5)	-	63.5	486.9	550.4	-	(80.0)	(620.0)	(700.0)	-	(100.0)	(700.0)	(800.0)
Total	4,049.5	330.8	1,329.8	5,710.1	8,342.7	457.4	1,875.0	10,675.1	12,431.8	684.3	2,390.8	15,506.9
Trend	(100)	(100)	(100)	(100)	(206)	(138)	(141)	(187)	(307)	(207)	(180)	(272)

(1) Including Art Academies.

(2) Current expenditure for schools by provinces and municipalities not broken down into type of school.

(3) Institutes for the blind and deaf and dumb, boarding schools, etc.

(4) Scientific Institutes, libraries, youth activities, sport and the whole sector of Art (excluding the Art Academies).

(5) Extraordinary expenditure.

( ) = only very global estimate.

(b) Projected educational expenditures as share of total budget in 1970 and 1975

(i) Federal Government

The increase in the total ordinary budget of Federal Government was even more rapid: from Sch. 23.0 billion in 1955 to Sch. 63.8 billion in 1965 or by 177 per cent, that is by 1.45 per cent against every 1 per cent increase in Gross National Product.

If this trend were to remain the same during the coming decade,(1) the future magnitude of the central government's ordinary budget could be calculated as follows:

Table 78

Expected magnitude of educational budget in 1970 and 1975

(In billion Schillings)

	1965	1970	1975
1. Gross National Product(1)	147	178	223
2. Trend	100.0	121.1	151.7
3. Trend x 1.45 elasticity ratio	100.0	130.6	175.0
4. Total ordinary budget(2)	63.8	83.3	111.65
5. Total ordinary budget in 1963 prices	57.3	74.8	100.2
6. Budget Ministry of Education(3)	4.7	7.6	11.4
7. 6 as a % of 5	8.2	10.2	11.4

(1) According to Dr. Steindl's Preliminary Report (in constant 1954 prices).

(2) In constant 1965 prices.

(3) According to expenditure projection given below.

As the projection of expenditure, given in the previous chapter, is expressed in constant 1963 prices and as prices between 1963 and 1965 rose by some 11.4 per cent, we had to deflate the above projection of the ordinary budget (line 4) to arrive at figures (line 5) which are comparable with the projected increase in the budget of the Ministry of Education (line 6).

We have seen (Table 73) that between 1955 and 1963 the share of the budget of the Ministry of Education in the total budget of the Federal Government did not change much but fluctuated around an average of 7.2 per cent. Since 1963, however, it went up quickly from 7.2 per cent in 1963, to 7.7 per cent in 1964 to 8.2 per cent in 1965.

As can be seen from the figures given here, this percentage will have to rise further if the financial target, set in the previous Section, is to be reached: 10.2 per cent in

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(1) The trend 1955-65 is in current prices (i.e., includes the inflation factor), the projection 1965-75 is in constant prices of 1965 (leaves the inflation factor out). No doubt the increase in prices (about 44½ per cent between 1955 and 1965) has greatly increased the elasticity ratio which we took as a basis for the revenue projection. By taking the same elasticity ratio for the period 1965-75 we implicitly assume that inflation will play the same role as it did in the past.

1970 and 11.4 per cent in 1975.

In itself this increase in the relative share of the budget for education does not seem very dramatic or infeasible but without more information about the anticipated future claims of other sectors of public activity it is impossible to say anything more on this point.

(ii) Provinces and municipalities

Total expenditure of the provinces (excluding Vienna) on ordinary account increased from Sch. 3,906.2 million in 1956 to Sch. 8,043.7 million in 1963(1) or by 106 per cent, which is 1.54 per cent for every 1 per cent increase in Gross National Product over the same period.

The corresponding trend in the expenditure of the municipalities(2) was from Sch. 7,779.6 million to Sch. 15,604.4 million, that is by 101 per cent or by 1.46 per cent for every 1 per cent increase in Gross National Product.

(When measured over the same period 1956-1963 the increase of the central government budget of 108 per cent is only slightly faster than the increases in the budget of the provinces and municipalities).

Applying the same method as in paragraph 2 above, the future budgets of the provinces and municipalities can be estimated as in the following table.

On the strength of the figures in this table it seems most likely that the expenditure targets given in the previous chapter can be reached with only a very moderate increase in the relative share of the educational expenditure in the budgets of the municipalities and the provinces.

Our main conclusion is that, with the present system of educational finance the shift in financial responsibilities towards the central government is such that, whereas the Federal Government will have to increase its budget of education substantially from 7.2 per cent of the total budget in 1963, and 8.2 per cent at present to 10.2 per cent in 1970 and 11.4 per cent in 1975, the financial efforts of the provinces and municipalities need hardly be increased.

(c) Central versus local financing

One of the most interesting trends in the anticipated development of public expenditure up to 1975 is the relatively moderate increase in expenditure of the Länder and municipalities. This trend will be partly concealed by the huge compulsory school construction programme to be borne by the municipalities during the coming years, but when the peak of this programme is passed the shift in financial responsibilities towards the Federal Government will become more clear.

The causes of this development, inherent in the present system of financing, are fairly obvious:

- Of those schools for which the provinces and municipalities are responsible (the compulsory schools) the Federal Government subsidises the greatly expanding cost component; teachers' salaries (100 per cent for the general, 50 per cent for the

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(1) Financial data of the expenditure of the provinces and municipalities was only available up to 1963.

(2) Including Vienna and the expenditure of groups of communities cooperating in the so-called "Schulgemeindeverbände".

Table 79

Expected magnitude of educational expenditure of provinces and municipalities
(In billions of Austrian Schillings)

	1963	1970	1975
1. Gross National Product(1)	135.5	178	223
2. Trend	100	131.4	164.6
Provinces			
3. Trend x 1.54 elasticity ratio	100	148.4	199.5
4. Ordinary budget of the Länder(2)	8.0	11.9	16.0
5. Projected ordinary school expenditure(2)	0.267	0.377	0.584
6. 5 as a % of 4	3.3	3.2	3.65
Municipalities			
7. Trend GNP x 1.46 elasticity ratio	100	145.8	194.3
8. Ordinary budget of the municipalities(2)	15.6	22.8	30.3
9. Projected ordinary school expenditure(2)	0.843	1.255	1.691
10. 9 as a % of 8	5.4	5.5	5.6

(1) In constant 1964 prices.
(2) In constant 1963 prices.

vocational compulsory schools, moreover 60 per cent for confessional private schools);

- The Federal Government is responsible for the major part of secondary education and for all higher education. These sectors are not only more expensive but can also be expected to grow more rapidly in conditions of progressive expansion than the compulsory schools of which the expansion, per definition, is limited by the demographic trend.
- The Federal Government's policy of taking over private schools.

A relative easing of the financial burden on the regional and local authorities might be considered a sound development in a situation where the fiscal capacity of these authorities is weak and mainly based on regressive sources of revenue. This, however, is not the case in Austria where the provinces and municipalities, apart from administering a number of own taxes, receive a considerable part of the important central tax revenue, including the progressive income tax. Between 1955 and 1963 the increase in revenue of the provinces and municipalities was hardly less than of the Federal Government and there is no reason to believe that this will be different in the future.(1)

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(1) To maintain that the regional and local authorities in general are not less prosperous than the central government does not mean, of course, that there are no provinces and municipalities of which the financial position is very weak. But this is a problem of regional inequalities which cuts across the distinction between levels of government in general.

It is highly likely, therefore, that there will be room for a greater financial participation of the provinces and municipalities in the future. This could take the form either of a reduction of the percentage of state subsidies to the compulsory schools or of an increase of the responsibility of the provinces and municipalities for secondary schools now financed by the Federal Government.

The amount of central government funds becoming available in this way could then be partly used to finance the rapidly expanding cost of the remaining part of secondary education and of higher education, and partly to solve the problems of regional inequality.

(d) Regional inequalities

It is hardly possible to suggest a reduction of financial aid to regional and local school authorities in general without stressing at the same time the need for more financial aid to the poorer regions of the country. In other words the need to replace a system of grants that favours the wealthy and poor regions to the same extent, by a system more deliberately aiming at a reduction of the regional inequalities in educational expenditure.

We do not know enough about the government's regional development policy in general, which should form the framework of these specific measures,(1) nor about the exact degree of the inequalities in educational opportunities between regions, nor about the correlation between financial strength and the provision of education. This prevents us from making more specific suggestions about the degree and methods of a subsidy policy designed to change the pattern of regional inequalities. It is known, however, that the regional differences in educational facilities are very great indeed and this impression is confirmed by the financial data given earlier in this chapter (pages 188-189).This in itself is sufficient to suggest that it will be worthwhile to investigate what role educational finance can play in solving this problem.

(e) Loan financing

The increase in total expenditure from 2.9 per cent to 4.8 per cent of Gross National Product in twelve years and the increase in the share of the educational budget in the total budget from 8.2 per cent in 1965 to 11.4 per cent in 1975 might not be exceptional in the light of international experience (expenditure for education has gone up very rapidly in many countries), it could certainly create a number of financial problems, which cannot be treated without sufficient information about other future claims on public funds. It is, moreover, possible that the educational targets on which our expenditure estimate is based will be revised upwards, which will result in even higher expenditure projections. This might easily lead to a projected level of expenditure which clearly exceeds the limits of ordinary financial means.

It is therefore necessary to pay attention to extraordinary ways of financing that will reduce the burden on the ordinary budgets: loan financing and the participation of private firms, whereas at the end of this chapter some attention will also be paid to the financing of higher education.

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(1) Generally speaking it might be that a government does not aim at an equalisation of regional differences but prefers to develop certain regions more quickly than the others. It might also be that a provision of equal educational facilities in every municipality is considered as undesirable from the point of view of efficiency and has to give way to a gradual concentration of facilities in the larger centres.

Financing part of the country's school expenditure out of the revenue of public loans, while diminishing the burden on the ordinary budget of the government, does not reduce the drain on the country's real resources (manpower, skills, building capacity, materials and equipment). If there are serious shortages in real resources (e.g. a limited capacity of the building industry) loan financing will be of no avail or only shift the difficulties from one sector to the other. The issue of public loans, moreover, has to fit into the country's monetary policy and its success will depend on current conditions of the capital market. These and other problems which limit the possibilities of applying this kind of financing fall outside the scope of this report.

Loan financing, secondly, is justified in those cases where expenditure is of an exceptional or temporary nature. The question whether the expenditure is to be considered an investment (in contrast to current consumption) is obviously irrelevant in the field of education. It is generally agreed that a very great part of education is to be considered non-physical investment. The fact, however, that most of the expenditure on education is on a recurrent basis makes it unsuitable to be financed out of loans. Only that part that can be considered exceptional or temporary may be financed out of loans, the amortisation of which can follow when expenditure is back on its normal level.

For at least part of the projected increase in expenditure on schools in Austria, this condition is fulfilled. The 1962 School Act has resulted in a considerable increase in classroom requirements in primary education (to be financed by the municipalities and provinces), which shows a certain peak. The fact that the number of pupils is also expected to decline after a peak has been reached, can only increase the irregular nature of annual investment requirements. In certain sectors of secondary education great arrears in space and equipment have developed. These arrears and the crisis situation existing in higher education may make it necessary to adopt a crash programme that exceeds the normal financial limits and justifies loan financing.

Plans are already under consideration in the Ministry of Finance to issue a public loan, to the amount of Sch.1,000 to 2,000 million to finance the huge school investment programme of the municipalities. The amortisation of this loan would have to be financed by the municipalities but the interest would be paid by the Federal Government.(1) Spokesmen of the Ministry of Finance were rather sceptical about the possibility of using loans as a means to finance school expenditure of the Federal Government. Past experience seems to have been less satisfactory. The accumulation of educational tasks in the years ahead,(2) the urgency of the problems to be faced(3) and the, perhaps temporary, worsening of budgetary constraints might simply force authorities to revise the existing policy and have recourse to less traditional means of financing in order to avoid an even greater accumulation of arrears in the future.

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(1) This, of course, would again result in a relative increase of the financial burden on the central government.

(2) To mention only a few points that are coinciding in time: the effects of the 1962 School Act extending the compulsory schools by one year, the reorganisation of teacher training and the creation of the new type of teacher training colleges, the existing shortage of teachers, the enormous arrears in higher education.

(3) The creation and replacement of highly qualified manpower is not an education task that can be postponed or spread out over a greater number of years without serious effects on the Austrian economy; failure to solve this problem because funds are scarce might lead to a vicious circle in which the negative impact on the growth of the national income make future possibilities to finance a solution even smaller.

(f) Public versus private financing

As in many other countries, trends in the system of financing education in Austria shows a tendency towards a greater contribution of public funds as against private sources of finance. The government is subsidising private institutions to a greater extent than before or simply taking over private schools, the public sector in itself is expanding more rapidly; fees and other sources of special revenue are declining (either absolutely or relatively); the government increases its expenditure on scholarships and other forms of students' aid, etc. It is very difficult to see how this trend could be reversed except, perhaps, for certain special types of education which will be discussed below. The trend towards greater public participation does not seem to be merely the outcome of a deliberate government policy, which could be changed easily, but at least partly the result of the admitted inability of private institutions to face the rapidly growing costs of schools and their pressure for greater government subsidies.

In spite of the fact that the possibilities to increase the share of private finance in education generally seem to be very limited, it is certainly worthwhile to investigate ways by which the financial participation of directly interested private sectors might be increased in those types of education where deficiences make themselves most directly felt, e.g. private industry and commerce in respect of vocational, technical and commercial education, farmers' organisations in agricultural schools,etc.

Some private firms, facing shortage of qualified manpower, offer to deposit substantial amounts of money (sometimes Sch.10,000) into the saving accounts of those pupils in technical schools who undertake to enter the firm's service after completing their studies. This seems an indication both of the great scarcity of trained technicians and of the availability of private funds.

It is our understanding that Austrian tax laws do not contain any provision to apply tax exemptions for spontaneous private financial contributions to education. Similar to the systems existing in many countries, of tax exemptions on investments in physical capital, private investments in education could be encouraged by way of freedom from tax. Such a system would not only encourage the financial participation of private firms but all other forms of private contributions (endowments, gifts, etc).

It is doubtful whether this method alone would be sufficient to induce private firms individually to participate more actively in education. Seen from the point of view of the individual firm expenditure on education and training is a very risky investment, if only because of uncertainty about the length of time during which the firm will enjoy the benefits of the investment made. Any trainee might quit after a relatively short period of service. For industry and commerce as a whole this risk is of course much smaller. For this reason attempts to encourage representative organisations of these sectors of the economy is probably more successful than to interest private firms.

Where necessary and possible this integration of private enterprise in the field of education could take the form of active co-operation between public and private bodies, e.g. in a form in which part of the real resources is brought in by the government (say: teachers, and administrative and inspection staff), while private industry bears the rest of the costs (say: room, equipment, maintenance, scholarships or wages of students).

(g) Financing of higher education

The financing of higher education, certainly, is too difficult and complicated a subject to be dealt with in the scope of one brief paragraph. In Section 4(f) below, some detail is provided on the expenditure pattern for higher education between 1956 and 1965 which particularly included a re-direction of funds away from direct provision of educational facilities towards more indirect expenditure items: social and other transfers. The Education Survey 1965 of the Ministry of Education gives a critical evaluation of the situation that has developed. The major points of interest are:

- State scholarships and other forms of student aid were greatly extended (roughly 40 times). The main purposes of the new Act on Students' Aid were (a) to increase the number of students, especially the participation of the lower income groups, and (b) to improve students' performance. However, no exceptional increase in the number of entrants was recorded during recent years.
- The increase in the number of staff and the investment in buildings and equipment stayed so far behind the increase in the number of students that a situation has developed which is described as a state of crisis. Already in 1954-1955 Austrian universities were unsatisfactorily equipped and far below international standards; ten years later the situation was far more critical.
- In spite of this, Austria is still exporting one of the country's scarcest goods: highly educated and qualified manpower, at a bargain. 20 per cent of total enrolments are foreign students; 70 per cent of them are from industrialised countries; although they pay triple fees,this is less than 10 per cent of what they cost the government. Apart from that, many graduates of Austrian origin leave the country to take up employment abroad either because salaries are higher or research opportunities are better than in Austria.

This situation gives rise to a number of questions which may be worth investigating:

To what extent will it be necessary, during the coming decade, to shift the distribution of available funds away from all forms of students' aid towards direct provision of educational facilities: more and better paid staff (also auxiliary staff that might reduce the burden of routine activities on teaching staff and research workers), more room and equipment, more research facilities? Even without a further increase in scholarships, a greatly increased "supply" of education (more places) might have a favourable effect on "demand" (enrolments).

If a further increase in financial aid to students is deemed necessary, would it not be preferable to give this aid in the form of loans instead of scholarships? This form of aid might not only reduce the burden on the government budget (after some time) but could also be manipulated as an instrument to counteract the outflow of graduates to other countries.

To what extent can private industry be interested (financially and otherwise) in a rapid extension of research facilities?

Would it be feasible to charge fees to foreign students up to an amount that represents the actual current costs per student? Free and indiscriminate exchange of students might be desirable from the point of view of international solidarity and understanding - when the balance of this exchange is so much against the country that faces serious internal difficulties, there might be every reason to give priority to the training of the country's own citizens.

D. Summary

The present chapter provides a measure of the resources which will have to be mobilised if Austria is to expand its educational system in the decade 1965-1975 roughly to the extent foreseen in Chapter II. The resource estimates given here constitute a quantitative reference point that help in gauging the importance of three policy conclusions to be developed in our next, and final, chapter: 1) the great effort that will have to be exerted in order to provide the educational facilities necessary for even the minimum educational expansion which demographic, social and economic factors impose on Austria during the next 10 years; 2) the need to strive for considerably more than that minimum in the field of secondary education so as to meet the urgent manpower requirements of an economy in transition as well as a social demand that may rise more rapidly in the future than it has in the past; and 3) the necessity to improve the efficiency of the educational system to make such expansion possible with the limited resources that are or can be made available.

In the present chapter, estimates are given of the requirements for the three major types of resources which must be provided: school accommodations, teachers and finance.

School accommodations

Projections of the additional school space needed between 1965 and 1975 were made for the general compulsory schools (excluding the new polytechnic courses) as well as for all school types at the intermediate and secondary level. The raw data which formed the basis for the assessments were supplied by local headmasters, thus avoiding any unwarranted assumptions as to the general applicability of trends that may be limited to certain regions.

1. General compulsory schools

In the case of the general compulsory schools, the local estimates of enrolments and numbers of classes - based on, e.g., demographic factors, local school building projects, and the likely consequences of structural population changes, housing and area development projects, etc. - were collated and reviewed at the province level; the projections, with respect to enrolments, did not differ significantly from those made in the 1st Assessment of Chapter II despite the radical difference in the methods used.

The survey showed a number of new classrooms which will be made available between 1965 and 1975 as a result of existing school building and enlargement projects, the deficit that will still exist over and above that number at the end of the period covered, and the approximate cost involved in both the existing projects and in the additional building that will be required.

The main results, with respect to the public schools, may be summarised as follows:

Table 80

Classroom needs and corresponding building costs for public general compulsory schools, 1965-1975

	Number of new classrooms	Cost of building and enlargement (1964 prices)
New classrooms resulting from existing building and enlargement projects	6,861	4.335 billion Schillings
Remaining deficit of 2,414 classrooms plus 508 classrooms already planned by Salzburg province (which did not indicate number and types of buildings).	2,922	1.460 billion Schillings
Maintenance, renovation, replacement of old buildings, etc.	----	700 million schillings
Total estimated cost (in round figures)		6.5 billion Schillings

It was estimated, however, that the above total could be reduced to some 5 billion Schillings if the construction of gymnasia and work rooms is temporarily postponed.

2. Intermediate and secondary schools

A similar enquiry was conducted at local level for the intermediate and secondary schools, and one of the factors taken into account in this case was the rising social demand. The aggregate of the local estimates indicated an increase in participation ratios for the relevant age groups from 15.3 per cent in 1964/65 to 19.3 per cent in 1969/70. But a national review of these estimates by the Federal Ministry of Education resulted in revisions which - because of financial, technical and administrative constraints on school building possibilities - brought the projected 1969/70 participation ratio down to 16.9 per cent and indicated an anticipated ratio of 19.8 per cent for 1974/75.

The additional classrooms that would be needed in 1974/75 after completion of current construction and enlargement projects - no such projects exist as yet for the second half of the decade under consideration - are shown below for public and private intermediate and secondary schools:(1)

All intermediate and secondary schools .... 3,414 additional classrooms needed
Public schools alone . . . . 2,529 " " "

Teachers

The estimates of the demand for new teachers between 1965 and 1975 included three components:

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(1) The role of private schools is much more important in secondary than in compulsory-level education. See Chapter I, Section A4.

(i) Expansion demand

This was based on the enrolment expansion projected in the school accommodation survey described above. The number of teachers per class was calculated, for the general compulsory schools, in accordance with the provisions of the Finance Equalisation Act of 1959 (except for the polytechnic course - see Section B2 of this chapter). For the intermediate and secondary schools, the teaching force target was assumed to increase in direct proportion to the increase in the product of the total number of classes multiplied by the weekly number of periods per teacher as set by the curricula.

(ii) Wastage rate

This was assumed constant at existing levels. It is important to note that, although it was not possible to give quantitative expression to expected changes in the rate, wastage will, in fact, rise, especially at the compulsory-school level, as a result of the increasing proportion of female teachers.

(iii) Replacement demand

This demand component is expected to rise rapidly over the next decade at both the primary and secondary levels in view of the age structure of the present teaching force. Assuming, for example, that all teachers retired at the age of 65, the number of retirements would increase in the general compulsory schools from 306 in 1966 to 676 in 1976 and, in the general secondary schools, from 74 to 258 during the same period, rising to 308 by 1978.

It was determined, however, that the true future situation would be most faithfully represented by assuming that every second teacher will retire at the permitted - but not obligatory - age of 60.

The three components described above made up the overall demand which was calculated for each of the school types. Then, for the intermediate and secondary schools - in which teachers with different kinds of educational qualifications exist - the overall demand figures were broken down by type of diploma qualification; this was done by projecting the existing distribution of diploma qualifications in each type of school into the future.

Finally, an overall supply and demand balance sheet for all public and private(1) general compulsory, as well as intermediate and secondary schools, was drawn up. This covered teachers holding the two types of diploma qualifications which account for the overwhelming majority of the teaching force: teachers with general compulsory (primary, upper primary or special) school diplomas, and those with general secondary school teaching diplomas. The supply of new recruits to the teaching profession was derived from the teacher training output estimates of Chapter II, which were corrected in accordance with the percentage of graduates deemed likely actually to go into teaching.

As a result of the confrontation of supply and demand, the deficit in teachers qualified to teach in general compulsory schools was estimated to be:

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(1) Regarding the role of the State in relation to teachers in the private schools, see below.

For the period 1965/1966 - 1969/1970

According to the 1st supply assessment	5,700
" " " 2nd " "	5,300

For the period 1970/1971 - 1974/1975

According to the 1st supply assessment	4,900
" " " 2nd " "	3,650

The deficit of teachers with general secondary school teaching qualifications was estimated as follows:

For the period 1965/1966 - 1969/1970	1,800
" " " 1970/1971 - 1974/1975	5,100

Financial Resource Needs

1. Division of financial responsibility among government levels

While the municipalities have, in particular, operational responsibility for all the public general compulsory schools as well as for nearly half of all public commercial education, and the provinces for all compulsory vocational education, the Federal Government bears more than three-quarters of all public expenditure on schools. Virtually all teachers' salaries in the public general compulsory schools are, for example, paid by the Federal Government, as is half the total salary bill of the compulsory vocational schools. In addition, the Catholic Church schools - which represent by far the major portion of private education and which play an active role, e.g. in teacher training and, to a lesser extent, in general and technical secondary education - receive a State subsidy amounting to the salaries of 60 per cent of their teaching personnel.

2. Basis for the two projections of educational expenditure

(a) Enrolment estimates

Two projections of public expenditure on education were made. The first, a preliminary estimate carried out in August 1965, was based on the 1st Assessment of future enrolments (see Chapter II), and the second, drawn up in February 1966, on the less conservative 2nd Assessment, which took social demand trends into account. But during the period that elapsed between the two expenditure projections, an amendment to the 1962 School Organisation Act was adopted postponing the statutory increase in the teacher/pupil ratio.(1) Therefore, the 2nd expenditure projection assumes the maintenance of the 1963/64 ratio, with the result that it foresees substantially lower expenditure than does the 1st projection for the compulsory schools while being considerably less conservative with respect to the other educational levels.

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(1) See Chapter I, Section A4.

(b) Choice of base year

The base year for the expenditure projections is 1963, the most recent year for which financial data of all public authorities were available. An exception was made, however, for higher education, the year 1965 being chosen because of the exceptionally rapid rise in budgetary appropriations between 1963 and 1965. In these circumstances, the use of 1963 as the base year would have been less realistic and would have led to very low cost estimates.

3. Calculation of the various components of expenditure

(a) Personnel expenditure

It was assumed that teachers' real salaries would increase at the same rate as the real rise in Gross National Product per capita - in indexed terms, from 100 in 1963 to 136 in 1970 to 168 in 1975.(1) This postulates only that in the future these salaries would keep up with the progress of the rest of the economy and makes no assumptions about any efforts to reduce arrears accumulated in the past.

With respect to the number of teachers, in cases where the 1st Assessment, summarised in Chapter II, contained estimates of teacher requirements, these were used as a basis of calculation in the first expenditure projection. In other cases, a constant ratio was assumed between the rise in staff and that in enrolments; and this latter assumption was made throughout in drawing up the second projection.

The assumptions underlying the projection of teaching staff for the institutions of higher education were, however, different. While the ratio of students to staff (excluding the Art Academies) has more than doubled between 1955/56 to 1963, budget appropriations, as noted in the previous section, have increased sharply since the latter year and a slight improvement in the ratio has already appeared. Thus, to avoid underestimating the government's determination to solve the problem, it was assumed that efforts would be made to bring the ratio to roughly the 1955/56 level by 1975.

(b) Other current expenditure

Current expenditure other than for personnel is expressed in the Austrian financial data as a percentage of all current expenditure. In view of the instability of these percentages, they could not be simply projected into the future; they were adjusted, where it seemed appropriate, to take account of known arrears in the material sphere or of wide variations from what is considered normal in other countries. In the case of higher education, quite arbitrary assumptions had to be made - in the absence of any appropriate basis of projection - for an important group of items: scholarships and other social measures, investment grants for students' housing, investment in equipment, and expenditure on university hospitals.

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(1) Derived from estimates made in Chapter III. See Table 47 in the annex to that Chapter.

(c) Capital expenditure

For school building, enlargement, etc. at the compulsory and secondary levels the cost estimates were based on the data provided in the school accommodation studies summarised above. The methods used in making these estimates are indicated below, as is the basis for calculating capital expenditure on vocational compulsory schools and higher education, which were not covered in the above-mentioned studies.

4. Results of the projections

The overall results of the two expenditure projections are given in the Table below: The following salient facts emerge from this table.

(i) According to the 1st projection, expenditure on education will increase by 160 per cent (from index 100 to index 260) between 1963 and 1975. The share of education as a proportion of Gross National Product (as projected by Dr. Steindl, Chapter III) would thus rise from 2.9 per cent to 4.5 per cent.

The 2nd projection foresees an increase of 172 per cent. Educational expenditure would then represent 4.8 per cent of Gross National Product - a figure not unusual by international standards.

(ii) On the basis of the 2nd projection, Federal expenditure on education would triple, while that of the provinces and municipalities, taken together, would fail to double.

Projections were also made of the proportion of total budget that would need to be devoted to education at the various government levels. This was done by ascertaining the ratio in recent years between the rise in total budget and in Gross National Product, extrapolating this trend to project budget figures for 1970 and 1975, and then determining what percentage of these overall budget estimates would be represented by the educational expenditure estimates summarised above. The results were as follows:

(i) The share of education in the Federal budget - which changed little between 1955 and 1963 but went up from 7.2 per cent to 8.2 per cent between 1963 and 1965 - would have to rise to 10.2 per cent in 1970 and to 11.4 per cent in 1975.

(ii) With respect to the provinces and municipalities, only a very moderate increase up to 1975 would be required. The figures here are:
- for the provinces - from 3.3 per cent in 1963 (latest date for which data is available) down slightly to 3.2 per cent in 1970 and up to 3.65 per cent in 1975;
- for the municipalities - from 5.4 per cent in 1963 (same remark as above) to 5.5 per cent in 1970 and 5.6 per cent in 1975.

5. Some policy questions that emerge from this investigation

A number of important policy questions which have emerged from this enquiry are discussed in Section C3 of the present chapter. A few of these issues are briefly noted below:

Table 81

Estimated public expenditure on education, 1963-1975

(Net expenditure in millions of Schillings - at constant 1963 prices)

	First projection	(Trend)	Second projection	(Trend)
1963				
Federal Government	4,049.5	(100)	4,049.5	(100)
Provinces	330.8	(100)	330.8	(100)
Municipalities	1,329.8	(100)	1,329.8	(100)
Total	5,710.1	(100)	5,710.1	(100)
1970				
Federal Government	8,424.8	(208)	8,342.7	(206)
Provinces	439.6	(133)	457.4	(138)
Municipalities	1,954.1	(147)	1,875.0	(141)
Total	10,818.5	(189)	10,675.1	(187)
1975				
Federal Government	11,808.7	(292)	12,431.8	(307)
Provinces	629.0	(190)	684.3	(207)
Municipalities	2,424.2	(182)	2,390.8	(180)
Total	14,861.9	(260)	15,506.9	(272)

(a) Central versus local financing

The projections summarised above showed the need for only a relatively moderate increase in expenditure by the provinces and municipalities. When the peak of the huge compulsory school construction programme borne by the municipalities is past, the shift in financial responsibilities towards the Federal Government will become still clearer. There may, therefore, be room for greater financial participation by the provinces and municipalities - possibly through a reduction in the percentage of State subsidies to the compulsory schools or a sharing of the financial burden of Federal-supported secondary schooling.

(b) The reduction of regional inequalities

The above suggestion of a reduction in financial aid to the provinces and municipalities in general must be accompanied by an emphasis on the need for more aid to the poorer regions. There would appear to be a need for a system of Federal grants that deliberately aims at reducing the very great regional inequalities in educational facilities. The magnitude of these differences can be seen from the financial data given in Section C1 of this chapter.

(c) Financial policy with regard to higher education

Certain imbalances have resulted from the shifts in financial policy in this sector in the last nine years. While scholarships and other forms of student aid were greatly increased, the increase in staff and in investment in buildings and equipment have stayed so far behind the rise in the number of students that a critical situation has developed in the overcrowded Austrian universities. At the same time, 2 per cent of total university enrolment is accounted for by foreign students, whose financial contribution is less than 10 per cent of current expenditure per student. Furthermore, many Austrian university graduates go abroad to work after completing their studies. Thus Austria appears to be "exporting" a scarce commodity in a very large quantity and at a very low price.

Some of the questions that arise in this connection are: to what extent will it be necessary to shift available funds away from student aid (whose efficacy, at least with respect to increasing participation by the lower income groups, has been questioned) and towards more and better-paid staff, buildings, equipment, etc? If a further increase in student aid is believed necessary, might it not take the form of loans whose terms could be used to discourage Austrian graduates from emigrating? To what extent can private industry be encouraged to participate, financially and otherwise, in a rapid extension of research facilities?

Chapter VI

CONCLUSION: MAJOR POLICY INDICATIONS FOR AUSTRIAN EDUCATION

Introduction

The present report has so far: (a) described how the structure of the school system is being adjusted with a view to broadening the stream to the higher levels of education; (b) projected, in the light of these adjustments and of observed demand trends, the estimated expansion of enrolment and output at the various educational levels during the next decade; (c) attempted to gauge the extent to which this expansion will fall short of providing the educated manpower needed for the modernisation and reorientation of the Austrian economy; (d) analysed the factors which could bring into being an effective social demand for education surpassing that which has been forecast on the basis of past trends; and (e) evaluated the resources necessary to accommodate an expansion of even the magnitude now projected.

In this final chapter, an attempt will be made to bring together the threads of these investigations and to underline and clarify their major implications for educational development policy and planning. Those sectors in which expansion is most urgent will be identified and targets will be suggested in line with the envisaged needs of society and the economy. At the same time, a number of issues of a qualitative nature - e.g. psycho-hygiene of the teacher, the elimination of teacher shortage, methods of teaching, problems of student flows, the role of psychological and guidance services, etc. - will be discussed with a view to the efficiency of the system and hence to its ability to achieve the necessary expansion with the resources available.

The present introductory section seeks to provide a succinct preliminary view of some of the salient points that will be developed in the body of the chapter.

The Austrian situation placed in an international perspective

In order to place the problems of Austrian educational development in a broader international context, the chapter begins by showing how the educational systems of other industrialised countries are facing a similar challenge, usually in a much more acute form, stemming from: mounting birth rates, a vastly expanding demand for more and better education, a transformation of the labour market structure as a result of accelerated rationalisation and automation of production, and a shift of emphasis away from production itself to such activities as research, development and planning. The response to this challenge by a number of European countries - Belgium, France, the Netherlands and Sweden - is analysed in terms of rising enrolments and educational expenditure as well as of reforms in educational structures.

The structural adaptations of the various European countries examined in some detail in the body of this chapter, reveals one of the basic tendencies in modern educational reform which is the progressive dismantling of the traditional systems in which pupils are divided into rigidly compartmentalised streams along lines of social class. In these European countries it has been found that in pursuit of the democratisation of education - which is both a social goal and an economic necessity - the reform, and ultimately the replacement, of vertically organised systems is seen to consist of three steps: (a) the establishment of approximately the same syllabuses for all 10-to 15-year-olds; (b) the introduction of transfer links between divisions; and finally, (c) the creation of material conditions and a climate of opinion that would permit the complete elimination of the traditional barriers between divisions.

The magnitude of the problem of Austrian educational expansion

Turning to specifically Austrian problems, the enormous effort needed to provide the increased resources called for by the projected expansion of enrolments is stressed. Particular attention is given to the teacher requirements, to the increasing fluctuations in the teaching force as a result of the rising proportion of women teachers, and to the fact that overall shortages are likely to be compounded by structural shortages which, if vigorous action is not taken, will endanger intermediate and secondary school functioning at present levels.

Yet the requirements of the economy will, very likely, far exceed the projected output of the secondary schools - even that foreseen in the 2nd Assessment of Chapter II which takes into account an extrapolation of recent social demand trends. Moreover, it is shown that social demand itself, strongly influenced by rising levels of parental educational attainment and changes in the occupational structure, is closely interdependent with the manpower demands imposed by the economy and tends to grow in snowball fashion in rapidly evolving modern societies.

The needs of the economy, as estimated in Chapter III, suggests that every effort be made to reach an annual output by 1975/76 of 26,000 secondary school leavers with certificates entitling them to enter higher education. This would represent a doubling of the present output and would far surpass the estimate of 18,800 projected for 1975/76 in the 2nd Assessment. Nevertheless, this report accepts this latter figure as a practical goal under the now foreseeable circumstances with respect to resource development (teachers, buildings, etc.) for education.

In putting forth this suggestion, it is stressed that twice as high a rate of increase should be aimed at for secondary vocational school output as for output in the general secondary schools. This is in order to catch up with a great unsatisfied demand for places in the vocational schools(1) and to meet an even greater demand by the economy for better-trained specialists.

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(1) See Table 89 of this chapter for data indicating the extent of pent-up demand for intermediate and secondary vocational education.

Reforms in structure and method to improve the efficiency of the system

The ability of the educational system to develop to the degree and in the directions desired depends in large measure upon the existence of an appropriate structural framework. This framework has been provided by the 1962 School Act, which may be usefully recapitulated here. Thus, the main programmatic points of that Act are designed, inter alia: (a) to tap new reserves of talent, especially in rural areas, through the structural and institutional innovations already noted in this report; (b) to give concrete recognition to the regional diversity of Austria through a federal structure for the administration of compulsory schooling, with considerable provincial autonomy; (c) to democratise school administration through the establishment of provincial and district councils on which parents' and teachers' representatives have advisory votes; (d) to remove the last vestiges of 19th-century privilege by, e.g., abolishing all school fees; (e) to improve the preparation of teachers and raise the standing of the profession by providing general education and professional training in two separate, consecutive stages.

This framework provides the basis for exploring several further lines of action with a view to increasing the efficiency of the Austrian educational system in pursuing the objectives of expansion, modernisation and democratisation. Although it is noted that the problems involved fall within the competence of the newly created Scientific Department of the Ministry of Education, they are directly taken up in an annex to this chapter in which the extensive commentary from public and private authorities related to Austrian education are taken generally into account.

The following are, briefly, among the points covered:

1. Measures to increase the efficiency of general compulsory education, especially with a view to remedying the effects of the teacher shortage

In this connection, while the new school curricula stress rationalisation of the educational process through measures centred on the pupil (attention to the individual needs of each pupil, establishment of a closer relationship between theory and practice in the learning process, etc), less direct attention has been given to the teacher. The University Pedagogical Institutes and the Teacher Training Colleges should investigate the ways in which both the teacher's efficiency and his personal adjustment to his working environment can be enhanced through, e.g., the planning and rationalisation of his work, improved relationships with his fellow teachers and with the headmaster and the school inspector, etc.

The value of programmed teaching is also emphasised, and it is noted that only isolated attempts have so far been made to introduce it in Austria. Finally, the functions of the Pedagogical-Psychological Service, introduced in 1965, are described, and recommendations are made for their extension, especially in the areas of educational and vocational counselling.

2. Measures to improve the performance of the general secondary schools

The high attrition rates call, inter alia, for a serious re-examination of methods of selecting pupils for admission. It is suggested that selection solely on the basis of marks be progressively replaced by a system relying on the close and continued observation of pupils through co-operation among the Pedagogical-Psychological Service, parents and teachers. This would realise the basic objective of observation cycles without creating a need for major reforms in school structure.

A closely related problem is that of tapping talent reserves in educationally disadvantaged areas, especially rural districts. In this connection, the advisability of a large-scale extension of the new grammar schools mainly for future teachers is discussed, particularly in terms of the new patterns of general secondary schooling being created in Austria: a new school system accessible to talented 14-year-olds without examination, alongside a renewed system accessible mostly to 10-year-olds on the basis of an entrance examination.

3. Consideration of the establishment of some kind of "vocationally-linked" educational path whose successive steps bestow professional qualifications at different levels but which, followed to its end point, provides access to the university

Such a system, as applied in various forms in a number of countries, would be of great value in helping meet the urgent demand for qualified technical personnel of different degrees of competence.

To the extent that this report and the continuing work of the Scientific Department have stimulated and focussed public and expert discussion on these problems, a beginning may have been made towards further scientific investigations which can only be conducted with the active co-operation and partnership of all the authorities concerned.

A. The Problems of Austrian Educational Expansion in the European Context

1. Introduction: the economic, social and technological factors

The critical situation presented in the foregoing chapters including the expansion at every level of the educational system is not confined to Austria, and an understanding of this situation can be enhanced by recognising its manifestations as they appear and are dealt with in other countries. The change in the methods of production towards an accelerated rationalisation and automation, the emphasis in production on efficiency and on an increase in its preparatory stages, the attendant changes of social and professional structures and the gradual transformation of administration into a highly technical planning machine - all these developments are plainly discernible in the highly industrialised countries with whose growth Austria is related. These phenomena in turn are recognised as the forces behind the social and educational developments described: the lengthening number of years that more pupils stay at school (which in most cases is bound up with an extension of compulsory schooling) and the increased flow to all types of upper-level schools accessible after compulsory schooling, in particular, the flow to schools leading to higher education. An increased birth rate, noticeable in all European countries after the Second World War, and extended compulsory schooling, add to the demand for more school accommodation, more teachers and higher budgets. Jean Thomas and Joseph Majault sum up the essence of these developments in their book "Education in Europe - Modern Trends and Common Problems"(1) (Introduction to the Chapter "The Educational Systems", p.13) in the following manner:

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(1) Report submitted to the Third Conference of European Ministers of Education (Council of Europe, Strasbourg, 1963).

"In less than a century, scientific and technical progress, along with easy and rapid trade relations, have brought about a considerable improvement in living conditions in all countries. Civilisation itself has been affected; education is in a period of transition.

"Among the problems facing European States in this field the most crucial seem to be those falling under two headings:

- The increase in the school population and the prolongation of school attendance, resulting principally from the rise in the birth-rate after the second world war, from social development in some countries (higher standard of living, education open to all classes of the population, increase in the number of girls attending school) and from economic development (need for skilled workers, technicians and scientists).
- The adaptation of teaching to the new economic conditions that transform the labour market and consequently the nature and standard of the professions. The agricultural population is falling sharply with a corresponding rise in the industrial population and especially in the numbers employed in light industry, the qualifications required for many types of employment being higher than formerly.

Thus, during the last few years various countries have been considering or have carried through important educational reforms, the main principles of which accord with the following requirements:

- The extension of compulsory schooling in order that as large a number of children as possible may have the opportunity of going on to secondary, technical or vocational education, or at least of continuing their basic studies beyond the primary stage;
- The guidance of pupils according to their aptitudes and tastes towards those studies which will best develop them and will lead to employment suited to their abilities, having regard to the essential needs of the country."

The impact made by the second industrial revolution, which is commonly believed to have been caused by the explosion in scientific knowledge, has been accompanied by another "explosion": that of the pupil population, entailing an unprecedented rise in educational budgets. Under the term "explosion scolaire", Louis Cros illustrated growth of the French educational budget from 1880 to 1970, by drawing a very rapidly ascending curve such as is typical of a chemical explosion (see Graph 11).("The World Year Book of Education" devotes its 1965 edition solely to the phenomenon of the educational explosion).(1) The editors' introduction begins thus:

> "The enormous and rapidly increasing world-wide demand for education is one of the most important phenomena of our age. Education is now regarded as an essential commodity. Everywhere it is a high priority in national and international programmes. Strenuous efforts are made to increase the amount, to improve the quality, and to diversify the kind. The situation creates new hopes but also raises great problems. It cannot fail to have the most far-reaching consequences".

In recognition of the universality of the expansion of the school and education system, the Ministers of Education of the Member States of the Council of Europe have chosen the "Explosion scolaire" as the principal subject of their next (6th) Conference.(2)

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(1) "The World Year Book of Education, 1965; The Education Explosion". Joint Editors: George Z.F. Bereday, Ph.D., and Joseph A. Lauwerys, D.Sc. D. Lit. F.R.I.C., Evan Brothers Limited, London.

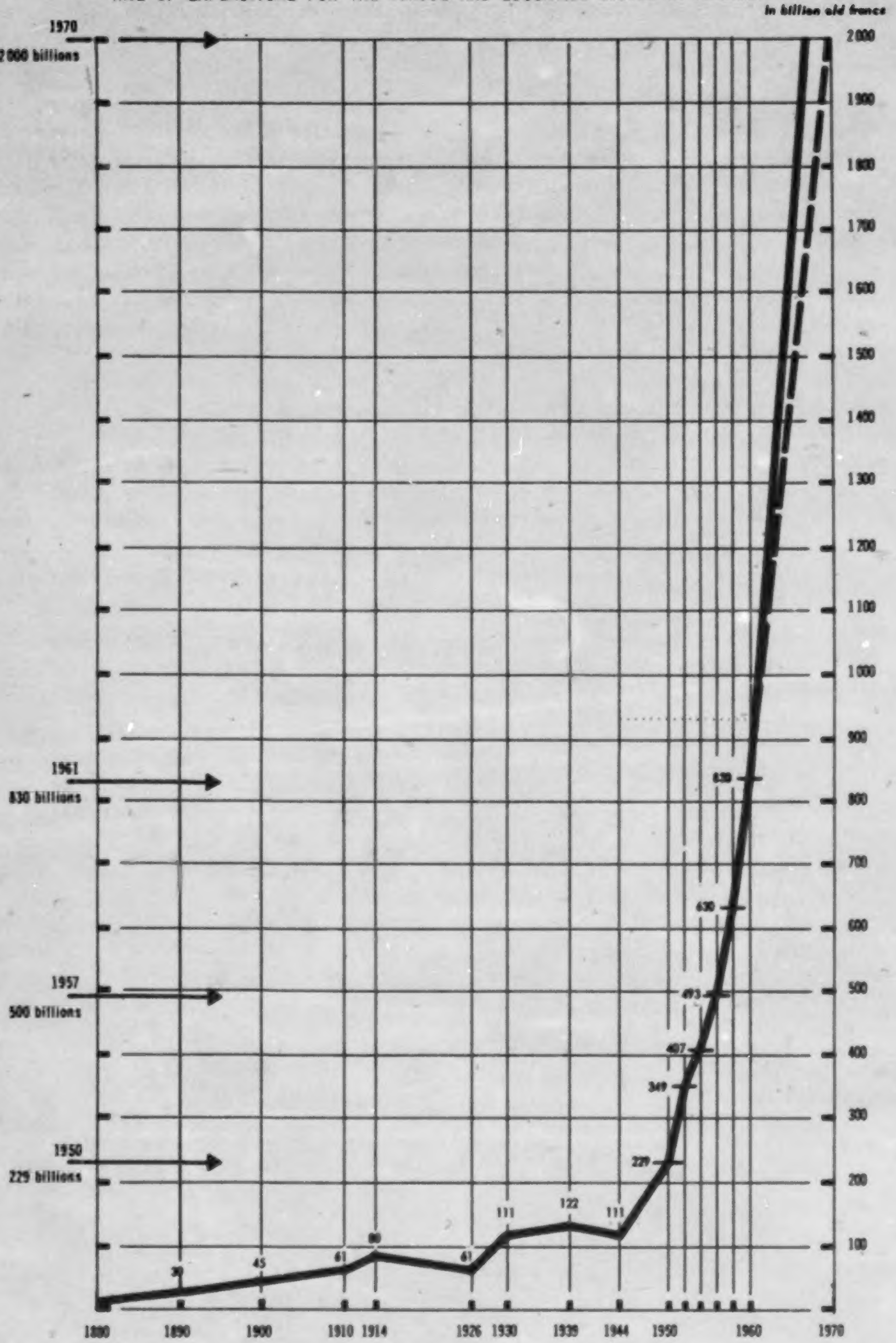
(2) The subjects scheduled to be discussed were:

The school population explosion, its implications for

- Pupil guidance and the problem of the transfer of pupils from one school or from one department to another;
- The place of examinations in the school system;
- The rate of pupil guidance in teacher training and re-training.

Graph 11

RISE OF EXPENDITURE FOR THE SCHOOL AND EDUCATION SYSTEM IN FRANCE



For a better understanding of the Austrian situation it seems appropriate to describe the related patterns of development (increase of the pupil population and expansion and ramification of the school and education system, growing demand for teachers, accommodation and finance, increase in the educational budget, improvement in the award of scholarships, etc.) in other European countries. For this purpose four countries will be dealt with in the following sections: Belgium, France, the Netherlands and Sweden.

2. Educational expansion in:

(a) Belgium

Belgian school statistics and organisation suggest a convenient initial comparison with Austria. Marion Coulon of Belgium points out in his report "The Education Explosion in Belgium" (in "The World Year Book of Education 1965", p.247) that the population growth in his country has not been of the same magnitude as in France or Holland. However, between 1945 and 1946 the number of births rose from 130,526 to 152,962, i.e., by about 17.1 per cent. It remained a little below this level for about 10 years and subsequently made a small increase to 155,061 by 1962. (See Table 82).

Table 82

The number of live births in Belgium and Austria
1944 to 1964 in absolute numbers and in indices

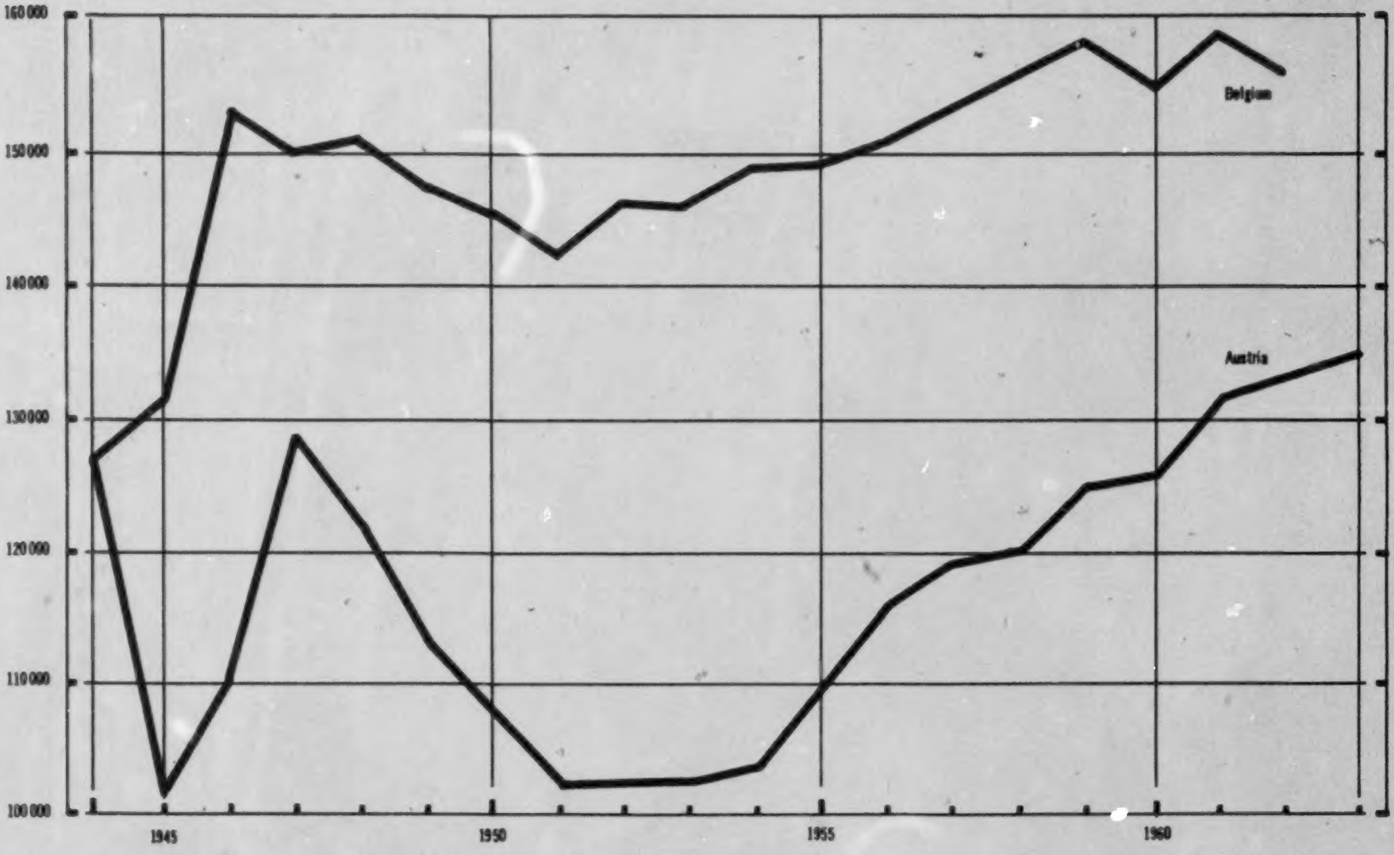
(the 1945 figure being stabilised at 100)

Year	Belgium		Austria	
	Absolute	Indices	Absolute	Indices
1944	127,122		126,938	
1945	130,526	100	101,369	100
1946	152,962	117	111,302	110
1947	150,227	115	128,953	127
1948	150,416	115	123,221	122
1949	147,854	113	113,375	112
1950	145,672	112	107,854	106
1951	142,314	109	102,764	101
1952	146,064	112	103,012	102
1953	146,125	112	102,867	101
1954	148,538	114	103,985	103
1955	149,195	114	108,575	107
1956	150,210	115	115,827	114
1957	152,871	117	118,712	117
1958	155,048	119	119,755	118
1959	158,237	121	124,377	123
1960	154,784	119	125,945	124
1961	158,431	121	131,563	130
1962	155,061	119	133,253	131
1963			134,809	133
1964			133,841	132

Source: Annuaire statistique de l'enseignement, 1965.

Graph 12

THE NUMBER OF LIVE BIRTHS IN BELGIUM AND AUSTRIA



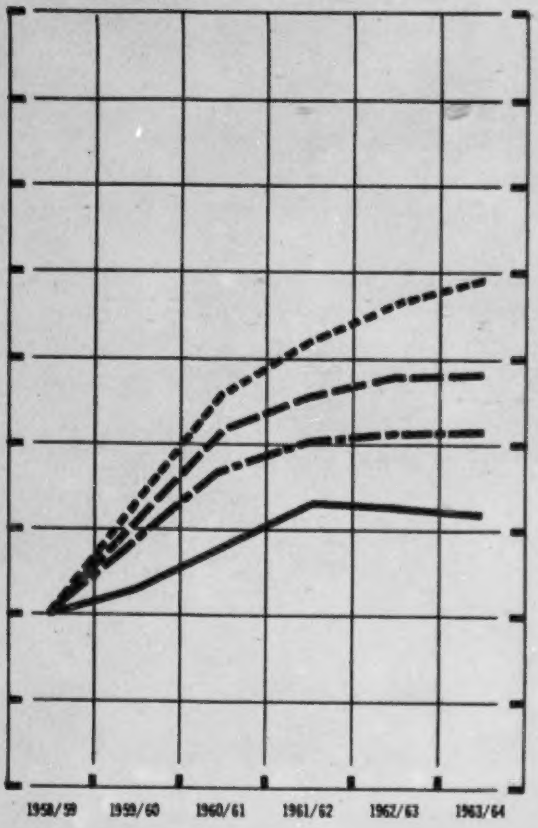
BELGIUM

Graph 13

TREND OF ENROLMENT FIGURES OF THE LOWER DIVISION OF THE GENERAL SECONDARY SCHOOLS

1958/59 to 1963/64

1958/59 = 100



—— Total of 12 to 16-year olds
1958/59 : 502,767 100
1963/64 : 560,086 111

— — — Number of pupils aged 12 to 16
1958/59 : 152,079 100
1963/64 : 195,293 128

—·—· of these male
1958/59 : 84,375 100
1963/64 : 101,892 121

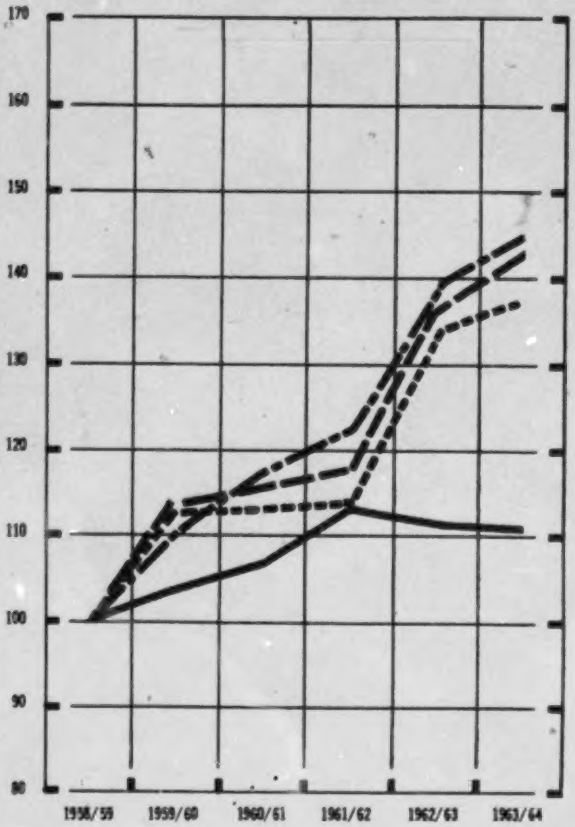
- - - - of these female
1958/59 : 67,704 100
1963/64 : 93,401 138

Graph 14

TREND OF ENROLMENT FIGURES OF THE INTERMEDIATE TECHNICAL AND VOCATIONAL SCHOOLS

1958/59 to 1963/64

1958/59 = 100



—— Total of 12 to 16-year olds
1958/59 : 502,767 100
1963/64 : 560,086 111

— — — Number of pupils aged 12 to 16
1958/59 : 153,585 100
1963/64 : 219,555 143

—·—· of these male
1958/59 : 80,642 100
1963/64 : 118,101 146

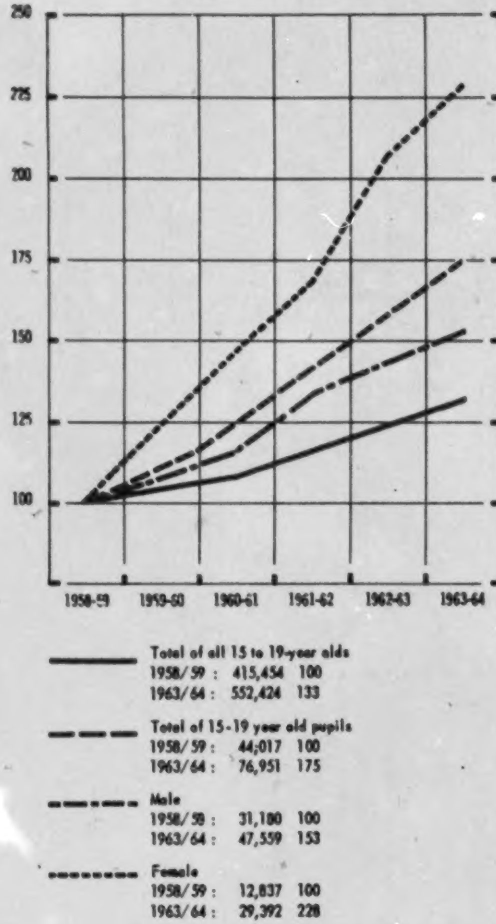
- - - - of these female
1958/59 : 72,943 100
1963/64 : 101,454 139

Graph 15

BELGIUM : TREND OF ENROLMENT FIGURES
IN THE UPPER DIVISIONS
OF GENERAL SECONDARY SCHOOLS

1958/59 to 1963/64

1958/59 = 100

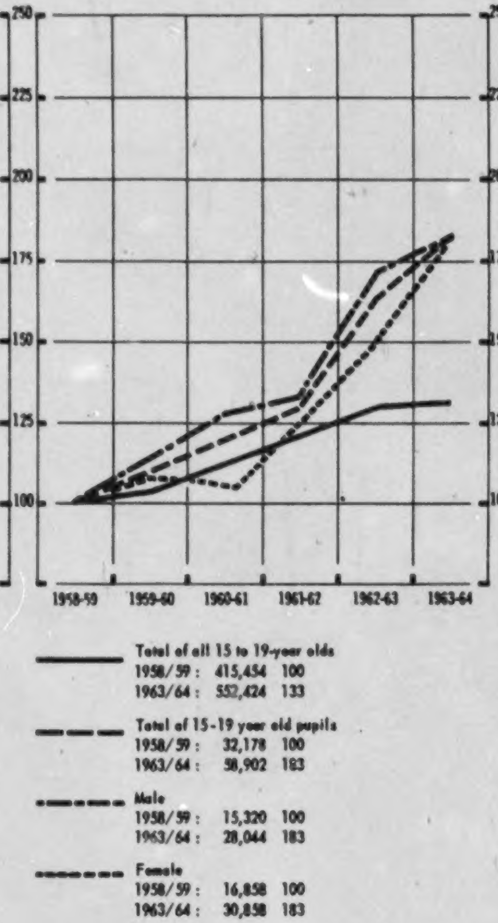


Graph 16

BELGIUM : TREND OF ENROLMENT FIGURES
IN THE UPPER DIVISIONS
OF VOCATIONAL SECONDARY SCHOOLS

1958/59 to 1963/64

1958/59 = 100

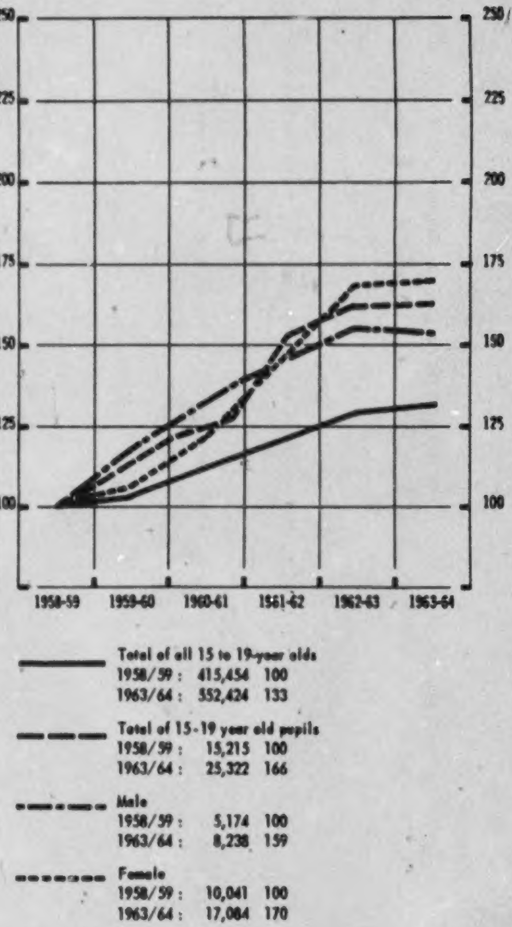


Graph 17

BELGIUM : TREND OF ENROLMENT FIGURES
IN THE UPPER DIVISIONS
OF TEACHER TRAINING COLLEGES

1958/59 to 1963/64

1958/59 = 100



If we compare these birth figures in Belgium since 1955 with those in Austria during the same years it appears that, while the birth rate in Austria has risen more steeply during the last ten years, the pattern has been roughly similar.

The pupil flow into the secondary schools and, therefore, the enrolment in these schools in Belgium has increased more rapidly than the demographic increase. This is illustrated in the accompanying set of graphs, (Graphs 13 to 17).

Furthermore, students in higher education increased even more dramatically in relation to their relevant age groups, as shown in Graphs 18 and 19.

Table 83 shows that the rate of growth of higher education 1956-1963 in Austria exceeded that of Belgium.

Table 83

Enrolment in Belgian universities and other institutions of higher education, and in Austrian universities, 1956/57 to 1963/64

Year	Belgium		Austria (1)	
	Absolute	Indices	Absolute	Indices
1956/57	41,802	100	15,000	100
1957/58	44,337	106	17,065	114
1958/59	47,016	112	20,270	135
1959/60	48,940	117	23,568	157
1960/61	51,999	124	28,159	188
1961/62	56,472	135	31,858	212
1962/63	63,504	152	35,007	233
1963/64	68,875	165	37,629	251

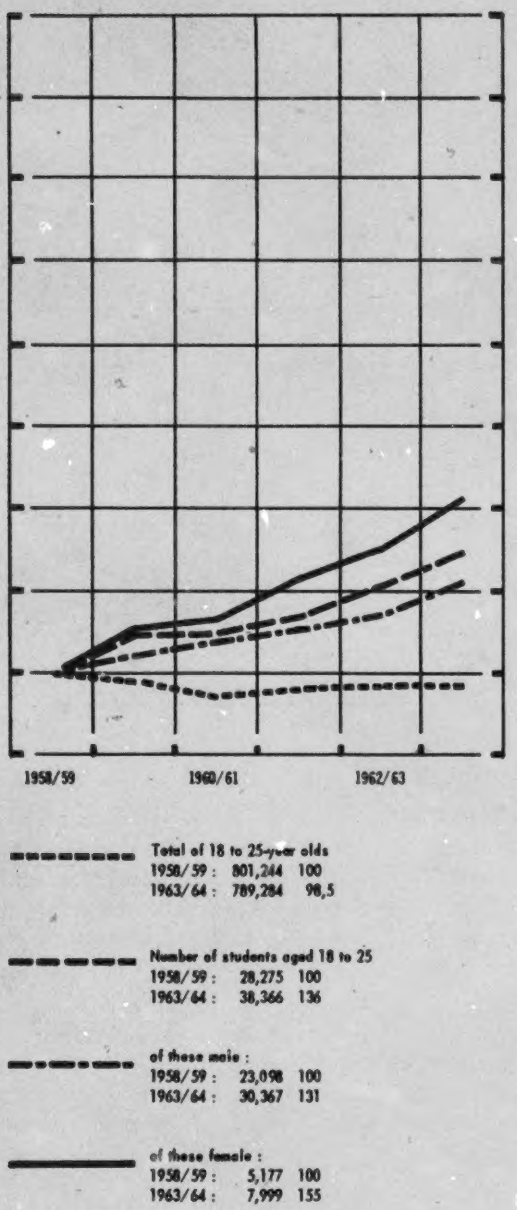
(1) Foreign students not included.

However, the demographic situation and the position of enrolment in Austrian higher education meant that Austria's rapid increase represents a trend towards catching up with European standards in this area. Thus Table 84, derived from the figures accompanying Graph 18 and Tables 16 and 18 of Annex to Chapter II, shows that the enrolment in university of the growing 18-25-year-old group has increased from 1.6 to 4.0 per cent during the 1955-1965 period. During a period of relative stability for this same age group, the Belgian participation rate had already reached 4.9 per cent two years earlier.

Another facet of the Belgian educational expansion is the increase in scholarships supporting the upper levels of education both in terms of number and expenditure. Table 85 shows that while the number increased sixfold, 1935-1963, the total expenditure also multiplied ten times to half a billion Belgian francs. There were about 62,000 scholarships at the end of this period.

Graph 18

BELGIUM : TREND OF STUDENT NUMBERS
AT UNIVERSITIES
IN THE YEARS
1958/59 to 1963/64
1958/59 = 100



Total of 18 to 25-year olds
1958/59 : 801,244 100
1963/64 : 789,284 98,5

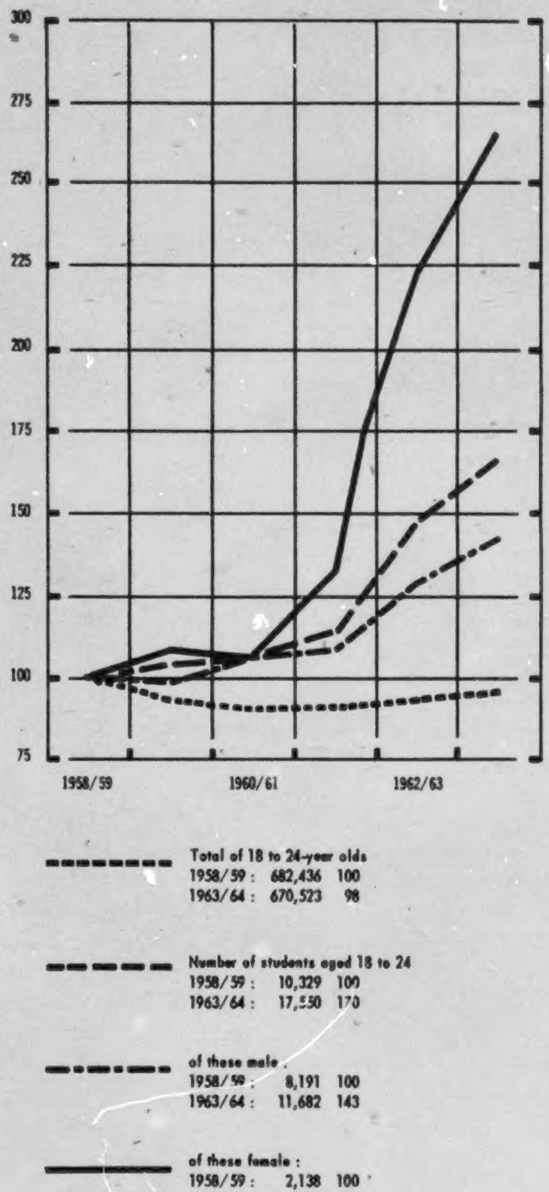
Number of students aged 18 to 25
1958/59 : 28,275 100
1963/64 : 38,366 136

of these male :
1958/59 : 23,098 100
1963/64 : 30,367 131

of these female :
1958/59 : 5,177 100
1963/64 : 7,999 155

Graph 19

BELGIUM : TREND OF STUDENT NUMBERS
AT INSTITUTES OF TECHNOLOGY
IN THE YEARS
1958/59 to 1963/64
1958/59 = 100



Total of 18 to 24-year olds
1958/59 : 682,436 100
1963/64 : 670,523 98

Number of students aged 18 to 24
1958/59 : 10,329 100
1963/64 : 17,550 170

of these male :
1958/59 : 8,191 100
1963/64 : 11,682 143

of these female :
1958/59 : 2,138 100
1963/64 : 5,868 274

Table 84

18-to 25-year-old university students, as a proportion of this total age group, Austria and Belgium

	All 18-25-year-olds		18-25-year-old students		Percentage	
	Austria	Belgium	Austria(1)	Belgium	Austria	Belgium
1955/56	695,600		11,501		1.6	
1958/59		801,244		28,270		3.5
1960/61	810,400		24,318		3.0	
1963/64		789,284		38,366		4.9
1965/66	868,600		34,490		4.0	

(1) Foreign students not included.

Table 85

Number of awards (A) and related expenditure (B) (in Belgian Francs), 1955-64 (the National Scholarship Fund)

	Secondary education upper level		Technological and other institutes of higher education		Universities		Total	
	A	B	A	B	A	B	A	B
1955/56	6,831	14,750,000	1,420	9,250,000	1,806	29,000,000	10,057	53,000,000
1956/57	7,883	19,800,000	1,898	13,350,000	2,812	43,600,000	12,593	76,750,000
1957/58	9,221	23,700,000	2,376	13,800,000	4,088	69,250,000	15,685	106,750,000
1958/59	11,073	34,500,000	3,295	30,600,000	7,921	156,300,000	22,253	221,400,000
1959/60	16,799	79,300,000	6,784	62,200,000	8,892	177,600,000	32,475	319,100,000
1960/61	21,999	94,000,000	9,920	83,700,000	10,027	197,600,000	41,946	375,300,000
1961/62	24,435	97,912,400	12,123	117,608,200	10,943	211,828,900	47,501	427,349,500
1962/63	29,898	116,418,580	13,310	134,761,650	11,844	227,990,000	55,052	479,170,530
1963/64 prelim. figures	34,500	137,000,000	15,500	155,000,000	12,500	250,000,000	62,500	542,000,[illegible]00

(b) France

The pioneering study of French education by Louis Cros, "L'Explosion scolaire", can provide a most convenient source for a brief description of the forces behind the expansion of French education in modern times, and this section will draw heavily from this work. The preface to the first edition (1960) contains striking numbers defining this explosion:

> "In 1970 France will have 11 million pupils and students of all categories, i.e. one-quarter of the French population. Included in this number will be sixteen times as many secondary-school children as at the beginning of the century (3,200,000 compared with 200,000) and twenty times as many students engaged in higher education or higher technical education (600,000 compared with 30,000). More than three-quarters of all children

> will be having secondary education, technical education or higher education, compared with two per cent in days gone by.
>
> "About a hundred thousand people were engaged in the teaching profession around 1900. Today their numbers amount to 450,000. This total will probably reach 650,000 in 1970. This means that they will represent more than half of the country's civil service (without their number being adequate even then). In addition this number should be increased by about 70,000 members of the teaching profession in private schools who will be paid, directly, or indirectly, by the state."

Cros then notes the financial implications of this expansion:

> "Today the amount spent is eighteen times what it was at the Liberation, seventy times more than it was during the last century, and thus represents a sum exceeding the total state budget at the beginning of the Third Republic."

Nevertheless, M. Cros points to the continuing insufficiency of the budget for education - classes are crowded, teachers are not well enough paid, many school buildings are too old - and there is a perennial lag behind the requirements of the educational expansion. Plotting the increases needed, Cros predicted that education would, in the foreseeable future, absorb as much as one-fourth to one-third of the nation's annual output.

The demographic development does not explain this educational explosion in France. The annual number of births in 1960 (about 800,000) was almost exactly what it was sixty years earlier. The important forces underlying this educational explosion are outlined by M. Cros in terms of the changes in the structure of the French economy and, therefore, in required professional and educational structure of the work-force:

> "Technical progress, when it has transferred man from the fields to the factory, further proceeds, in the long run, to displace him from both the fields and the factory into more independent and commercial realms of activity or, to coin a more expressive term, into relational activities. That is the situation in a country such as the United States."

M. Cros points out that the agricultural population of France in 1800 was 85 per cent of the total and the corresponding figure for the United States was 75 per cent. By 1954 these percentages were 27 and 13 for the two countries respectively, and the forecast, cited by M. Cros, is that France will have 15 per cent of its population on the land compared to 10 per cent in the United States.

During the same period, the industrial population for France is shown to have increased from 5 per cent in 1800 to 36.5 per cent in 1954 and is projected to increase to 40 per cent. The United States industrial population has apparently reached a peak during this period of 30 per cent and is projected to decline somewhat to 25 per cent in 1975. France is expected to follow this trend after 1975.

The working population employed in "relational" or tertiary activity shows a steady increase during the same period:

(per cent)

	France	USA
1800	10	15
1860	19	22
1901	28	34
1954	36.5	57
1975 (forecast)	45	65

Considering the structure of the labour force of France in these three broad categories, M. Cros notes their development involves not only a change in their numerical relationship but also a striking increase in the proportion of highly-qualified manpower within each of these categories. Farmers must become agronomists, industrial workers tend to be replaced by technicians and engineers, industry requires an increasing proportion of co-ordinating (office) personnel and the whole economy requires an increasing number of administrators, traders, researchers, professors, journalists, artists, doctors, welfare workers, etc. While at about the turn of the century in France only one or two of one hundred people required the standard of the baccalaureate, by 1975 the estimate,cited by M. Cros, is that about 30 out of 100 will require at least this standard.

M. Cros has an interesting passage on the financial implications of this demand for education:

> "In 1880, Jules Ferry called for one-sixth of the total budget for the state educational system. He called this ratio between education budget and total budget the golden rule of democracy.
> In recent years the allocation granted for the national education system has been as follows:
>
> - 149,000 million in 1950, equivalent to one-fourteenth of the budget (7.14%);
> - 296,000 million in 1954, equivalent to one-twelfth of the budget (8.33%);
> - 485,000 million in 1958, equivalent to one-tenth of the budget (10%);
> - 860,000 million in 1961, equivalent to one-seventh of the budget (14.29%).
>
> In 1962 the education budget exceeded 1,000,000 million, in other words nearly one-sixth or 16.67 per cent of the total budget.
> It would be unfair to deny the results achieved. Within the traditional frame of budgeting they are considerable, especially if, for purposes of comparison, the defence budget is excluded. Why is it then that the financial means and the facilities at the disposal of the national education system nevertheless remain below requirements?
> The answer is simple. It is because the "golden rule" has become out of date as soon as one-quarter of the population of a country is involved in the educational process, and especially since this involvement is not chiefly at primary grade, but secondary, technical and higher. This means that such studies of that large pupil population not only last two or three times longer, but are at the same time on a much higher level, more specialised and therefore more expensive. Besides, these studies have to be extended beyond the school age proper by the facilities provided for the continuing education of adults."

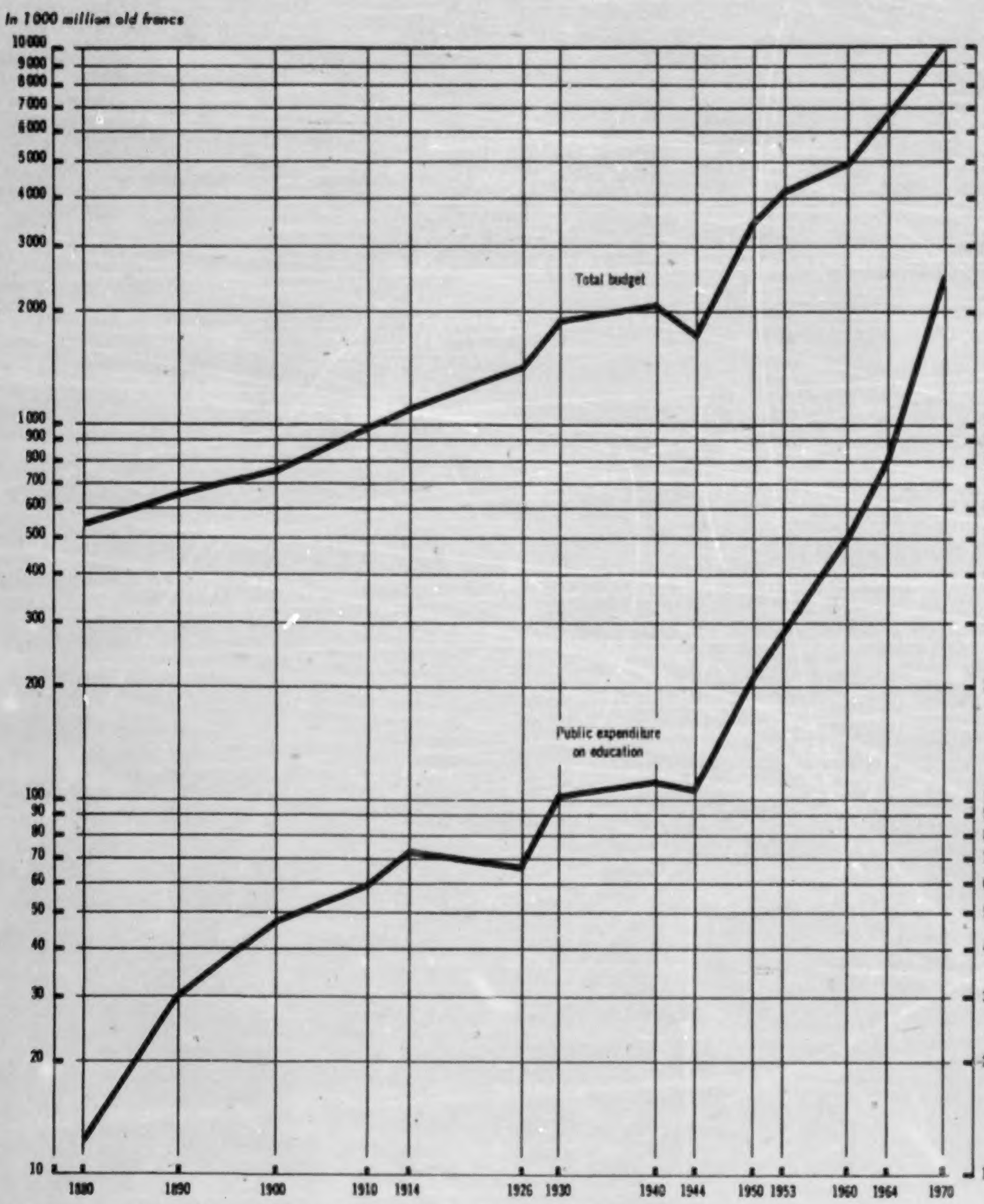
From this point of view, the following graph allowing for a comparison between the trends of the total and the educational budget will be of interest.

The above data concerning the French educational budget may be supplemented by the following extracts from the booklet "France and the Rising Generation" (edited by the Press and Information Division of the French Embassy in New York, in June 1965) on page 7:

> "The Education Ministry's staff (including the regional and local educational authorities) has practically doubled since 1955, increasing from 302,907 to 566,000, and accounts for almost half of all French civil servants. The Ministry's budget has been rising steadily in comparison with the national budget and totalled $3.18 billion in 1965, five times more than 10 years ago and representing 3.6 per cent of the gross national product, as can be seen from the following statement."

Graph 20

FRANCE : TOTAL AND EDUCATIONAL BUDGET 1880-1970



(The curves shown in the graph follow the logarithmic scale, so that the parallel lines indicate proportionally equal increases and decreases. The annual amounts have been converted to the present currency values (1960).

Table 86

Budgets and the gross national product, France

(in billions of dollars)

	1955	1959	1961	1963	1965
Gross national product	34.45	54.13	64.72	79.31	87.45
National budget	7.02	11.32	13.38	16.62	18.64
Education	.65	1.32	1.59	2.19	3.18
Defense	2.00	3.19	3.52	3.95	4.21
Percentage of budget					
Education	9.3	11.6	11.9	13.2	17.1
Defense	28.5	28.3	26.3	23.7	22.6
Percentage of gross national product					
Education	1.9	2.4	2.5	2.7	3.6
Defense	5.8	5.9	5.5	5.0	4.8

Despite this growth in the financing of French education major resource problems have yet to be solved. For example, the expansion of the secondary school population has not been matched by an increase in the number of teachers in their schools:

Table 87

Enrolments and number of full-time teachers employed in general secondary education(1) (public) for the years 1950 to 1965

Year	Number of pupils (thousands)	Number of teachers
1950	527.0	30,189
1954/55	641.3	35,550
1959/60	1,100.8	50,199
1961/62	1,368.9	74,136
1962/63	1,725.4	86,813
1964/65	1,943.1	102.921

(1) That is to say: Collèges d'enseignement général (CEG) and lycées. This does not include the specialised sections of the CEG (short vocational education). Since 1962/63, the lycées techniques are included with the lycées classiques et modernes.

It follows from the above material that in France, too, the pattern of development in the scholastic and educational field is the same as those found elsewhere, except for the fact that their course is more dramatic than in Belgium and Austria, viz.: the rise in the number of pupils owing to a higher birth rate, but primarily to the growing social demand, entailing enhanced requirements of school accommodation, teachers and administrative staff; the change in the methods of production and the transformation of the professional structure, the population and, last but not least, the increase in the educational budget. These phenomena, common to all Europe, assume a specific note in the Netherlands to which we now turn.

(c) The Netherlands

The developments which have taken place in Dutch education during the last thirty years are very similar to those observed in Belgium and France. Since in the Netherlands a very high percentage of pupils has, for some considerable time, attended secondary schools after completion of 8 years compulsory schooling, it is not so much the percentage which is unusual as the proportionally more marked trend of pupils' attendance towards such higher-level types of school as:

- vocational intermediate schools (full-time);
- intermediate general schools without access to higher education (which in the Netherlands are highly differentiated); and
- schools leading to higher education.

The Dutch report submitted to the OECD's EIP Programme in March, 1966,(1) comments on the point in question as follows:

> "Analysis of figures over a long period shows that drop-out rates for all types of schools are more or less constant. Major changes, however, can be noticed in the transfer rates. This development appears from Table 88 in which the number of entrants into the three major types of secondary education is given separately for boys and girls as a percentage of all 12-year-olds.

Table 88

The Netherlands: Number of entrants admitted to the first grade of secondary full-time education as a percentage of all 12-year-olds

	1930	1940	1950	1960	1962
Boys					
Vocational (2)	13.6	22.3	29.9	34.8	36.7
Non-pre-academic	16.5	19.8	25.4	33.3	31.9
Pre-academic	7.5	8.6	11.2	16.3	16.7
Total(2)	37.6	50.7	66.5	84.4	85.3
Girls					
Vocational	12.6	20.4	33.6	39.5	40.2
Non-pre-academic	14.7	18.1	25.1	34.8	34.9
Pre-academic	4.1	4.5	7.1	12.8	13.3
Total	31.4	43.0	65.8	87.1	88.4

(1) "Educational Policy and Planning - Netherlands", OECD, 1967, pages 51-53.

(2) Except elementary agricultural schools.

Graph 21

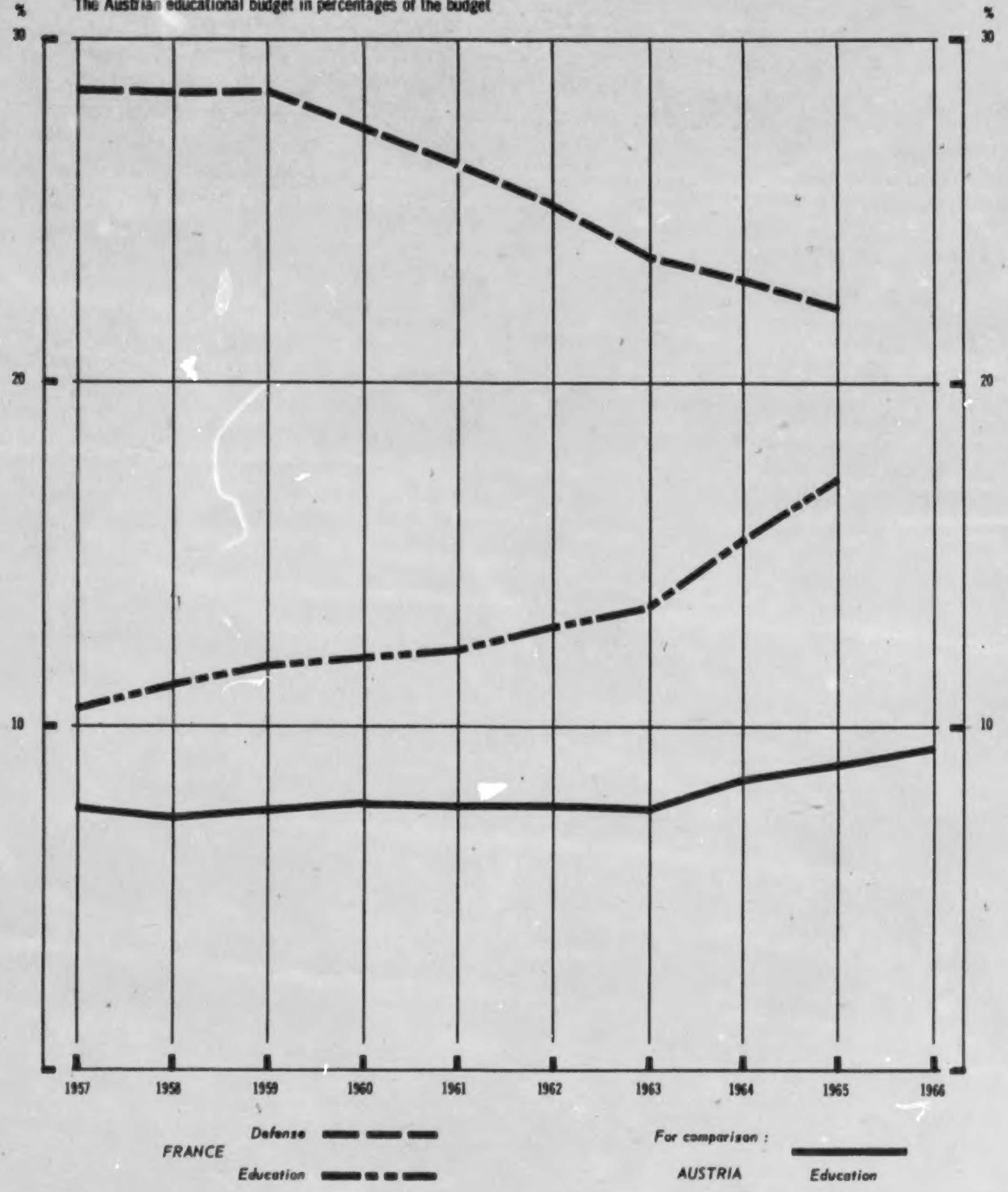
EXPENDITURE FOR EDUCATION AND DEFENSE IN FRANCE

1957 to 1965

In terms of percentages of the budget

For comparison :

The Austrian educational budget in percentages of the budget



"It should be noted that two major tendencies, more or less parallel to each other, emerge from the above figures. They are

- The already mentioned increasing transfer from primary to secondary education;
- A tendency to opt more and more for the higher-level types of secondary education.

"The increase in vocational education takes place mainly among pupils who, in the past, would have gone to work immediately after compulsory education. The increase in entry to non-pre-academic education comes mainly from families who, in the past, sent their children to vocational schools; the rise in pre-academic education is predominant among families who previously opted for non-pre-academic education. The increase in vocational education, therefore, is more or less equal to the increase in total transfer from primary to secondary education diminished, however, by a tendency of parents to favour non-pre-academic education over vocational education. The increase in non-pre-academic education caused by this trend is reduced by still another change in parents' preferences, favouring pre-academic over non-pre-academic education."

The proportionally more marked trend of pupils' attendance towards the higher-level types of secondary education illustrates vividly the increased demand for education in industrial society.

Finally, we quote the section from the Dutch report dealing with the necessity of planning and the growth of the educational budget:

"The necessity for planning in the field of education was first consciously felt after World War II.

"The high birth rate immediately after the war and the rapidly increasing enrolment rate in secondary and higher education created needs which had to be met. For secondary education alone the rate rose from less than 50 per cent in 1938 to over 90 per cent in 1958, thus exerting great pressure on the schools. The demand for teachers increased rapidly, bringing to light the existence of a serious manpower problem. Adaptation of the educational system, especially at the lower levels of secondary schooling, was necessary.

"More generally, the increasingly swift changes characteristic of our age call for the adaptation of education, in all its aspects, to tomorrow's needs and opportunities. Educational problems have become more and more complex, and it is clear that without effective planning, their solution is impossible.

"Among these problems, financial questions have an important place. The necessity of planning, if only for financial reasons, will be clear from some rough figures on the rise in the budget of the Ministry of Education, Arts and Sciences since 1951. In that year the budget totalled only 422 million guilders;(1) by 1965 it has risen to 3,194 million guilders.(2) In 1951 expenditure for educational and cultural purposes accounted for 8.5 per cent of the national budget; in 1965 it amounts to 25 per cent.

"More striking still is the fact that a growing share of national income finds its way to education and culture. In 1950 the percentage was 2.6 per cent; in 1965 it was 5.6 per cent and it is estimated that in order to meet present desiderata and others that are already making themselves felt, the percentage must rise to 8 per cent by 1975. Since such large amounts are involved, educational priorities will have to be weighed as accurately as possible against those for other social needs. The same is true of priorities within the field of education."

---

(1) Austrian Schillings 2,975.1 million.

(2) Austrian Schillings 22,517 million.
(The Dutch guilder equals 7.05 Austrian Schillings: currency of 20/5/66).

Once more we wish to stress the fact that the Dutch educational budget amounts to 25 per cent of the total budget, whereas the Austrian educational budget reaches the level of only 9.3 per cent of the total budget.

The Dutch educational budget allows direct comparison with the Austrian because of its analogous composition; it does, for instance, not include the expenditures for investments (capital expenditures).

(d) Sweden

The following section quotes in full a paper by Dr. Torsten Husèn of Sweden, which very succinctly summarises the main features of Swedish educational expansion in recent years.

"The educational explosion in Sweden

The new nine-year comprehensive or basic school (g G I II 9) was preliminarily authorised by the 1950 Riksdag, and provision was made for a pilot programme that was envisaged to last throughout the 1950's. It was initially launched in 14 districts having 2,500 pupils. Owing to the shortage of teachers and school buildings, government officials had to restrain local authorities who planned to initiate their pilot programmes; as of the 1957-58 academic year, therefore, these embraced no more than about 14 per cent of the Swedish school population. Towards the end of the 1950's, however, the basic school was set up at an accelerated rate. During the 1959-60 academic year, 217 communities with about 260,000 pupils were operating basic schools. The 1962 Education Act laid down a timetable under which this school type would be generally adopted. 1968 is the target year, with proportions of Swedes living in basic-school communities shown as follows: 1957: 14 per cent; 1962: 60 per cent; 1964: 80 per cent; 1966: 95 per cent;(1) 1968: 100 per cent.(1)

The expansion in primary and secondary education in Sweden

It may be contended, on good grounds, that the 'educational explosion' has anticipated the realisation of a basic school common to all young people. Since 1945 a rapidly growing number of the pupils completing seven or eight years' elementary schooling went on to lower secondary academic school ('realskola'), and in so doing "blew it up from the inside" - not only because of the greater pressure of numbers, but also because the 'realskola' curricula could cater for the educational needs of only a minority of boys and girls. In 1929 about 9 per cent of an age-group continued in the 'realskola'. This proportion rapidly swelled after the mid-1940's, and towards the end of the 1950's it exceeded 40 per cent. Enrolment in lower secondary education, at 85,000 in the 1944-45 academic year, grew to 162,000 in 1957-58. As of the latter year, the last three grades of comprehensive school had only 22,000 pupils, way below the 100,000 who were attending them in 1961-62. A similarly explosive increase in enrolment has taken place in the 'gymnasium' or pre-university school. The academic gymnasia had 17,000 pupils in 1945 as against no less than 63,000 in 1962.

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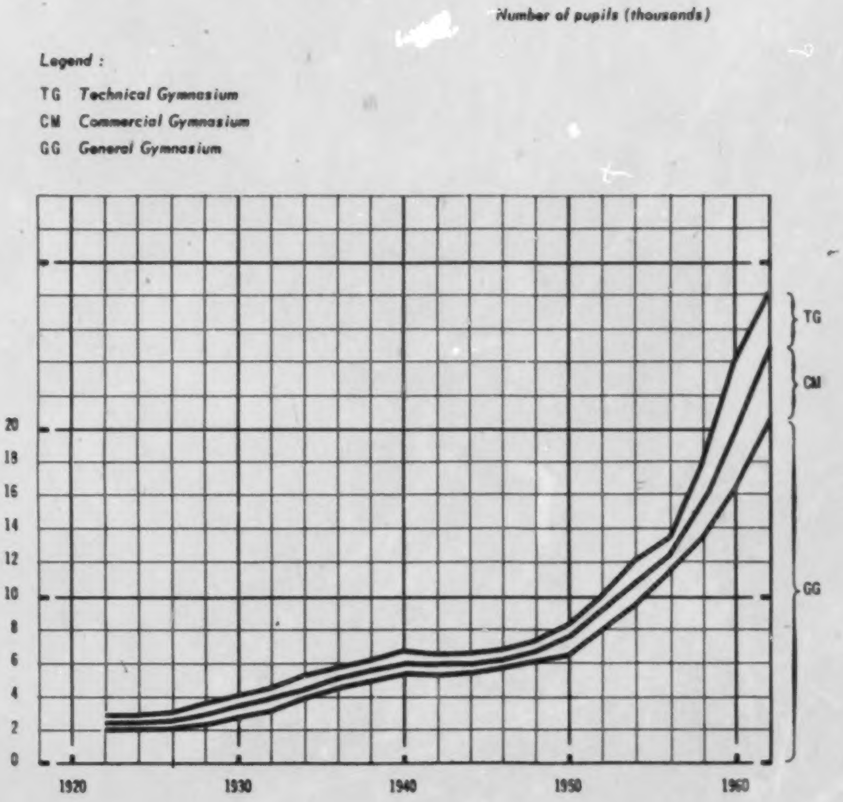
(1) The figures for 1966 and 1968 are estimates.

Graph 22

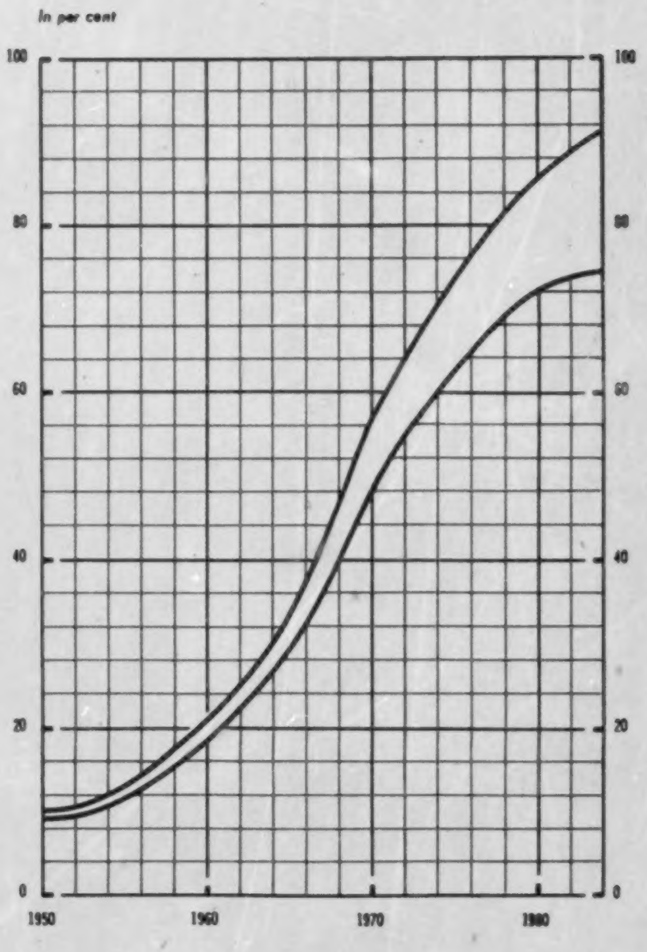
ENROLMENT FIGURES IN THE SWEDISH GYMNASIUM

(Grades 9 to 12 years or
11 to 13 years
in absolute numbers
1919 to 1961)



Graph 23

PROJECTED ENROLMENT IN THE SWEDISH GYMNASIUM UNTIL 1984



"Thus an ever greater number of Swedish teenagers are staying longer in school. Another way to measure the extent of their education is to determine what proportions of the different age-cohorts are devoting themselves full-time to it. At the beginning of the 1930's slightly more than 10 per cent of the age classes moved up to 'realskola' or its equivalent, while 4 per cent enrolled in the upper secondary levels. In 1953 the 'realskola' received about 38 per cent of an age-cohort. In consequence of the try-out programme for the comprehensive school and the implementation of the basic school, more than 50 per cent of the age classes were pursuing full-time studies in the 'realskola' or the last three grades of comprehensive school, by the beginning of the 1960's. At the end of this decade, as a consequence of the raised school-leaving age and the full implementation of the comprehensive school, this proportion will approach 100 per cent. A similarly rapid increase, allowing for difference in the time factor, holds true for the 'gymnasia'. In the mid-1940's about 5 per cent of those born in a certain year were attending the first 'gymnasium' grade. By 1957 this proportion had risen to 18 per cent (the specialised gymnasia here included). According to the 1960 Commission of Inquiry into the pre-university school (gymnasieutredningen), about 50 per cent of the age-cohorts will be pursuing studies at this level by 1970. Upper secondary education will then be given in the form of combined academic and specialised curricula and by the technical schools.

"The expansion of education at the upper secondary level and the universities is shown in the following table, prepared by the Forecasting and Planning Group in the Swedish Ministry of Education.

Table 89

Percentage of age-class pursuing full-time studies (or will pursue respectively)

	1950	1960	1965	1970
16-18 years	16	34	46	62
19-24 years	8	16	18	22(1)

(1) Compare the corresponding Austrian figures:

(per cent)

	1950	1960	1965	1970
16-18 years				
First Assessment	5.34	10.10	11.24	13.60
Second Assessment			12.42	16.57
19-24 years				
First Assessment	2.83	3.96	5.28	6.58
Second Assessment			5.46	7.33

"Given the force of tendencies in the mid-1960's the figures for 1970 are probably underestimated.

As of 1945, 16 per cent of an age-cohort passed lower secondary school graduation at the age of 16+. The proportion rose to 25 per cent in 1952, and in 1961 the qualification was conferred on almost 40 per cent either in 'realskola' or after having taken the academic programme of grade nine in the basic school. There has been a similarly rapid increase in the number of young people who at the age of 19+ have passed their 'studentexamen', which qualifies for university entrance. In relation to the population of 20-year-olds, the number holding such qualification from the academic and technical 'gymnasia' were as follows: 1945: 5.2 per cent; 1955: 8.9 per cent; 1961: 13.4 per cent; 1964: 15.6 per cent.(1)

"The expansion in vocational and university education in Sweden.

The vocational school system has also expanded fast, even though the government and the Riksdag have in the past few decades given priority to improved general education in the allocation of economic resources. From 1950 to 1962 vocational schools offering full-time instruction stepped up their admissions from about 10,000 to 60,000 pupils per year. By 1970 it is estimated that about 25 per cent of an age-cohort will enter vocational schools after completing their compulsory schooling.(2)

"To all intents and purposes, there is a definite tendency in the Swedish secondary school to minimize the distinction between a liberal and a vocational education. In a changing society more liberal education is needed on which to base training for the job world. The specifically vocation-oriented elements of teaching bulk relatively smaller in the overall picture than they used to, one reason being that it is impossible to know what any one occupation will demand in the way of future knowledge and skills. Efforts have been made to draw the organisational consequences thereof, first and foremost by the integration of 'gymnasia'(3) and specialised schools, and secondly by getting these schools to co-ordinate and co-operate with the vocational schools.

"Up to now forecasts have often been surpassed by the actual results - a sure sign of the force of Sweden's educational explosion. The tendencies governing at the beginning of the 1960's suggested that enrolment in upper secondary and higher education would double within a period of five to seven years.

"The number of students in Swedish universities and colleges has also grown much faster than expected. One reason is the greater proportion who pursue higher education after finishing 'gymnasium'; no less than 80 per cent of those who pass their 'studentexamen' now matriculate. The undergraduate population,(4) at 2[illegible],000 in 1956, rose to about 40,000 in 1963 and will reach a predicted 83,000 in 1970. By the same token the forecasts for academic manpower have been exceeded. As late as 1958, the Royal Commission on the Planning of University Education went on record as predicting a surplus of language teachers in the 1960-61 year. But as of 1963, the most crying need for teachers was in modern languages and Swedish. In Northern Sweden alone, the holders of more than half the language-teaching posts were not fully qualified."

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(1) Compare the corresponding Austrian figures: 1955: 6.6 per cent; 1961: 10.5 per cent; 1964: 11.1 per cent.

(2) Traditional apprenticeship training in Sweden is increasingly provided in full-time schools or classes specially designed for the purpose, and closely associated with the enterprises concerned.

(3) Significantly, the "commercial gymnasia" (which are comparable to our business academies) and the "technical gymnasia" (comparable to our secondary technical schools) are classified as "gymnasia".

(4) Number of students before the intermediate examination, i.e. before the 6th semester approximately.

Sweden can look back on a long peaceful development.(1) After the Second World War the birth rate rose only on a small scale. The increased flow to high-level secondary education after completion of compulsory schooling can be accounted for, almost entirely, by the enhanced social demand for more and better educational facilities. The example of Sweden strikingly bears out the significance of L. Cros's argument referred to above that decisive future development of the school and education system in Europe is a social evolution, which is beginning to reveal the outlines of the "educated society of tomorrow". It will be characterised by a truly 'éducation permanente' in the widest sense, that is, organised in all its parts and comprising all members of society.

B. Adaptations of European Educational Structures to Changing Economic and Social Conditions

1. The democratisation of education today and the problem of the "middle" schools

The previous section described major characteristics associated with the educat[illegible] explosion since World War II in representative European countries - Belgium, France, the Netherlands and Sweden.

These characteristics included a rising birth rate, rapidly increasing social and economic requirements for improved educational opportunity, "explosive" expansion of the schools and higher absolute and proportionate budgetary allotments for education. A further significant consequence of this educational explosion involves a re-organisation of the structure of these European school systems, which is of such paramount importance that a brief description of its most important elements in these countries is in order.

Even this brief exercise of comparative education contains an historical as well as a sociological perspective. Thus, school systems in Europe have been undergoing a fairly similar historical evolution. From the social history of the past two centuries two stages of social development can be distinguished: at the beginning of the (first) Industrial Revolution we have clearly defined social classes, whereas in our own age the structure of society tends to become pluralistic. The school systems in Europe at the beginning of this evolution were characterised by a marked dualism, i.e., individually independent, parallel structures. Most school systems of our days are characterised to a large extent by transferability, opening the way to further studies to all pupils, depending only on their suitability and not on their social origin. This is - very roughly speaking - the perspective within which the evolution of school systems in the last one-and-a-half centuries has taken place.

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(1) Rose Knight in her study "Trends in University Entry: An Inter-Country Comparison", in "Social Objectives in Educational Planning", OECD, 1967, remarks on the post-war situation in Sweden in the following manner: "As a neutral country, Sweden's educational problems were in some ways different from those of other countries. There is no evidence of a post-war rush to the universities. The steady increase in the output of graduates... may be partly due to increased public aid to students whether by scholarship or interest-free loan."

Looking at this evolution from the point of view of sociology we can say that school systems are an image of the social stratification: the structure of society is reflected in the structure of school organisation.(1)

The class-dominated society of the early 19th century is characterised by an almost complete lack of social mobility of families; children and their families belong to separated social classes; social improvement among the working-class families in town and country is as rare as the social drop of families belonging to the "educated and privileged classes". There is hardly any social mobility. Educational and vocational training are linked to a given social status; there are different schools for members of the different classes. In the historical evolution this "social rigidity" to which the "structural rigidity" of the school system corresponds gives way to greater social mobility of the family. "Democratic" society is characterised by an absence of social privileges. The greater social mobility of families in a pluralistic society corresponds to a greater possibility of transfer from school types formerly destined for the "lower classes" to those reserved for the "privileged".

In trying to describe this historical and sociological evolution in a general way - without going into individual differences between countries, that is - it may be said that what all European countries in the 19th century had in common was their essentially "aristocratic" school organisation in which class distinctions were accepted as a matter of course. These distinctions were reflected in what is known as the two-track educational system: elementary and primary education was intended for the "common" people and secondary education was to be reserved for the "upper" classes. There was practically no possibility of transfer. Elementary and primary education was aimed not at producing democratic citizens, but merely at preparing ordinary people for the position in life to which they were called. Secondary education, on the other hand, was conceived as training the potential rulers of the nation to take their rightful places in state, church or business life.(2)

If we want to understand the organisation of any given country as regards schooling and education we have to look closely at the way school organisation and social stratification are related. Recently some excellent investigations have been carried out in this field. Mention should be made in particular of Maurice Reuchlin's "L'orientation pendant la période scolaire - idées et problèmes" (published in 1964 by the Council of Europe) // L'éducation en Europe, Série II - Enseignement général et technique - No.3 //. We would like to quote the following passages in the English translation:

> "In very general terms, the commonest feature of the traditional pattern of educational organisation was a structure which could be described as "vertical". From the moment they enter school, or from very early in their school career, the children are placed in divisions in which they remain until the end of their studies. Often, these different "vertical" divisions recruit their pupils from different social groups. Naturally, the division designed for the less ambitious groups follows a shorter course.
>
> A movement to make the vertical organisation of education more democratic, with the sole aim of satisfying the demand for longer studies, would lengthen those courses which were too short and would introduce a certain similarity between the work of the different divisions, each of which would continue to recruit its members from a particular social group."

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(1) Cf. Helmut Schelsky "Schule und Erziehung in der industriellen Gesellschaft", Werkbundverlag Würzburg 1962, p.12.

(2) Cf. R. Freeman Butts: "A Cultural History of Education", New York 1947, p.429 et seq., and Vernon Mallinson: "An Introduction to the Study of Comparative Education," London 1961, p.178 et seq.

It is quite clear that democratisation of this "vertical" kind does not actually result in democratisation at all. From a strictly educational point of view it is very unlikely that certificates gained after a number of years of study in the socially "inferior" division would in practice have the same value as those gained after an equal number of years in the socially "superior" division.(1)

From a more general point of view, an essential aim of democratisation is to teach children from different social groups to mingle and get to know each other. This social experience could not be achieved if the barriers between supposedly parallel educational groupings were preserved.

This means that for many countries the main problem involved in making education more democratic consists in substituting, in place of these vertical systems, horizontal systems whereby all the children of a given age can be brought together, first in common schools, and subsequently in schools which offer a choice of courses and which keep the opportunity of transfer from one to another open as long as possible. The first step, therefore, towards a change in the system consists of bringing the traditional vertical systems into closer relationship with one another (by having approximately the same syllabuses for all 10-to 15-year-olds). This makes it easier to introduce legislation authorising transfers from one division to another. Such legislation constitutes the second stage of the reform. But the implementation of these legal measures encounters all sorts of practical difficulties, particularly as regards the introduction of different courses, or difficulties created by prejudices still nourished by parents and educationalists. The third stage in the reform of the system consists of creating material conditions and a climate of opinion favourable to the complete destruction of the traditional barriers between divisions.

This describes the direction which schools in Europe are taking to adjust themselves to the new economic and social conditions - i.e., towards the creation of better transfer possibilities between types of school that were formerly separated or, to put it in another way, towards realisation of the much-quoted "pedagogical principle of bridges and crossings", coupled with prolongation of obligatory schooling, a factor that itself encourages transfers.

It can be seen that the middle stage of schooling, the lower secondary level, for the age group generally between 11 and 15 years (starting with the entrance examination whenever the latter still exists) is the all important turning point for the pupils' ultimate school careers. Generally the decision is made at this stage whether or not the pupil will pursue a school-route leading to a university course of further education. In view of the long-term importance of this decision - H. Schelsky describes the school of our times as the "bureaucratic distributor of chances in life"(2) - one can easily understand the anxiety and the care lavished on this stage in all the countries of Europe (and elsewhere in the world). Everything is concentrated at this focal point of social forces: the desire for advancement in the more mobile family of modern industrial society, the rising demand in business and industry for better-trained specialists, the demand for social justice and the abolition of educational privileges - in a word, the whole of the increased educational requirements of industrial society (however they might be formulated). It would therefore be interesting and important from a pedagogical as well as from a sociological and economic point of view to investigate how the individual countries on the Continent are trying to solve problems of this sort.

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(1) In making a comparison of school systems we come up against a basic difficulty in comparing the school systems of different countries.

(2) Helmut Schelsky: "Anpassung oder Widerstand?" "Soziologische Bedenken zur Schulreform", Quelle & Mayer, Heidelberg 1963.

Belgium has introduced "polyvalent" schools for the 12 to 15 year olds so that transfers from one school type to another can be guaranteed - but, it should be pointed out, in both directions as far as prestige level is concerned. The traditional method of selection by school marks has been complemented by the introduction of an observation and orientation procedure, and this has led to the creation of important "para-scholastic" facilities. These are the "centres psycho-médico-sociaux". By doing this they hope, in Belgium, to have met the current pedagogical, welfare and economic needs.

In France, a school reform with a similar purpose has been established, in principle, since 1959, with the introduction of a period of "orientation scolaire" which begins in the 6th school year and now is proposed to cover a 4-year period, through the 9th school year. During these years, the curriculum of all schools is supposed to be adjusted so that no child will be barred from moving on into any other section of the upper secondary school, including those sections which lead to qualifications for the university (the Baccalaureate). At the end of the period of orientation, a council ("conseil d'orientation"), consisting of teachers, the school doctor, psychologist and professional career advisor, is charged with the responsibility of making a recommendation on the future school career of the student. The parents of a pupil may disagree with any such recommendation and appeal for entrance into a section in upper secondary school contrary to this recommendation. In this case, an entrance examination may be required.

The 1962 Post Primary Act in the Netherlands, establishes the legal framework for a school reform moving in the same direction as that of Belgium and France. The 7th year is announced as a bridging year (brugjaar), during which the students are to be observed with the particular purpose to make a judgement as to their future school careers. Most pupils in the Netherlands continue to be separated at the end of the 6th year into various types of school, ranging from the academic through the vocational, and this bridging year, therefore, occurs in these separate schools. However, as new schools are formed they may include the whole range of secondary schools brought within one school establishment, making the transfer possibility more readily available to the pupils after the bridging year and providing for the possibility of greater exchange among the pupils in subsequent years. Furthermore, the new school organisation proposed in the Post Primary Education Act established a vocational school line which leads to qualification for university entrance.

Since the Dutch Post-Primary Act is an enabling act providing only a framework for a new secondary school system, the Dutch authorities have stressed the importance of planning for the coming period.(1) Particularly, they have stressed the need to plan for a higher level of efficiency in the secondary schools, which is defined generally as the effectiveness of the schools in turning out an increasing proportion of qualified graduates in relationship to the total input into the schools. A key element seen by Dutch authorities in the development of such efficiency will be a development of an effective educational guidance programme directed towards the students in such a way as to give them a better basis in self-understanding and in facts concerning the opportunities in the social economy, to make a free choice on their future careers.

The middle stage of schooling in Sweden has become an inseparable part of a comprehensive 9-year course serving the 7-16-year-old school population. This new Swedish structure, which is now established in most of the country,(2) is generally recognised as having moved far in the direction of delaying a decision for most students on their future school career beyond the age of 15. During the 7th and 8th years, in this comprehensive school, the pupils are expected to choose certain optional subjects based upon their interests, but these options do not foreclose any choice in their future school careers. During the 9th year, the students may be divided into 9 separate streams, only two of which clearly prepare the students for upper secondary school leading to university (the grammar school). However, it should be noted that since the choice at this stage can be determined by the pupils and their parents, Swedish authorities report that two-thirds are now choosing the course leaving them the option to go on to higher education.(1)

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(1) "Educational Policy and Planning, the Netherlands". OECD, 1967.

(2) "Educational Policy and Planning, Sweden", a Country Policy Planning Report to the EIP Programme, OECD, 1967.

This system of free pupil choice is aided by various devices in these comprehensive schools, such as the opportunity for students to "listen in" for a while, on periods of classes one year ahead in the subjects in question, so that they may get an idea of what these subjects involve. (This is similar to a custom known in Switzerland as Schnupperlehren, "snuffling".) Also, the pupils are given opportunity to sample various types of careers in the economy by visits and talks and other experiences outside the school.

The emphasis of the Swedish approach to this problem of parent participation is significant in the light of Schelsky's description of the school in our time, as a "bureaucratic distributor of chances in life". Co-operation between parents and the school, which is essential for the functioning of the Swedish system, should be examined as a possible challenge to such a bureaucratic bias.

2. The duration of general education in member states of the Council of Europe

Shortage of space limits a more detailed exploration into these questions and further study of relevant conditions in other countries. However, it can be useful to attempt a summary description for member-states of the Council of Europe with respect to:

- the duration of obligatory schooling, especially the duration of elementary schooling (primary, lower stage) - Graph 24; and
- the point at which a decision has to be taken if a university education is envisaged, and therefore the duration of higher secondary education, Graph 25.

These graphs, concerning the duration of general education in the member-states of the Council of Europe, are meant to supplement the above effort to describe the adaptation of the educational system in four European countries to the changed economic and social circumstances since the Second World War.

The simplifications which are unavoidable in constructing such graphs are likely to lead to misinterpretations. We should like to emphasise this point strongly.

We can see from Graph 24 that the present (1966-67) duration of obligatory schooling in most member-states of the Council of Europe lasts 8 years. Only in Denmark is obligatory schooling limited nominally to 7 years. (In practice the majority of pupils leaving their obligatory schools go on to attend further schooling.) In Great Britain and France compulsory education lasts 10 years; 9 years of obligatory schooling is normally the case in Austria, in some provinces of the German Federal Republic, Luxembourg, Sweden and some cantons of Switzerland. In considering the organisation of the middle stage it is important to know the duration of the elementary stage, because when this has been completed the decision has to be taken, in some cases, about the future school route. We can see that the elementary stage in most member-states of the Council of Europe comprises 6 years in school. This applies to Belgium, parts of the German Federal Republic, England and Wales, parts of Finland and Greece, Iceland, Ireland, Luxembourg, the Netherlands, Norway, Sweden and Switzerland. In Denmark and Scotland it comprises 6, but only 5 in France, Italy and Turkey. In Austria it lasts 4 years as well as in parts of Finland, the German Federal Republic and certain cantons of Switzerland.

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(1) The principle of free choice is included in the Swedish Comprehensive School Act, paragraph 25, which stipulates that a pupil's studies at school are to be decided by the parents, in consultation with the pupil after information has been provided by the school.

There is also four year elementary school in Spain.

Graph 25 shows that the duration of secondary schools leading to higher education in Austria, the German Federal Republic and in parts of Switzerland lasts 9 years. Also, this graph illustrates that in nine member-states of the Council of Europe - Belgium, Denmark, France, Greece, Iceland, Italy, Norway, Sweden, Turkey - observation and advisory classes are the rule. In all these latter countries the introduction of these classes led to abolition of the entrance examination, since a decision on the pupils' future school-route could be postponed until his 14th, 15th, 16th year of age.

Through the introduction of observation and advisory classes and thanks to the extension of a school psychological service, selection methods have also been refined, attrition and drop-out have been reduced and higher output with less costs achieved.

The Austrian School Organisation Act 1962 is in line with this trend in that it introduces new types of upper secondary education and thus postpones the decision concerning the future school career to the 14th (15th) year of age.

C. Austrian Educational Expansion and its Implications for Resource Requirements

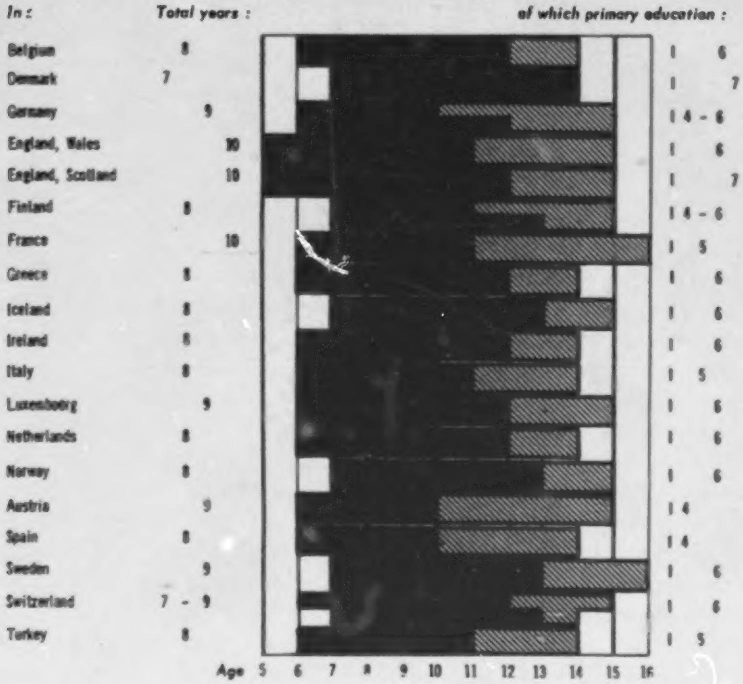
1. Introduction: the effect on enrolments of increasing births and longer schooling

With the background of general developments in European education since World War II sketched in the foregoing sections of this chapter, this final section will attempt to summarise major perspectives for the development of Austrian education over the next ten years, drawing from the details of this whole study and looking toward how our educational system might be able to adapt itself to the fresh social and economic conditions in our country.

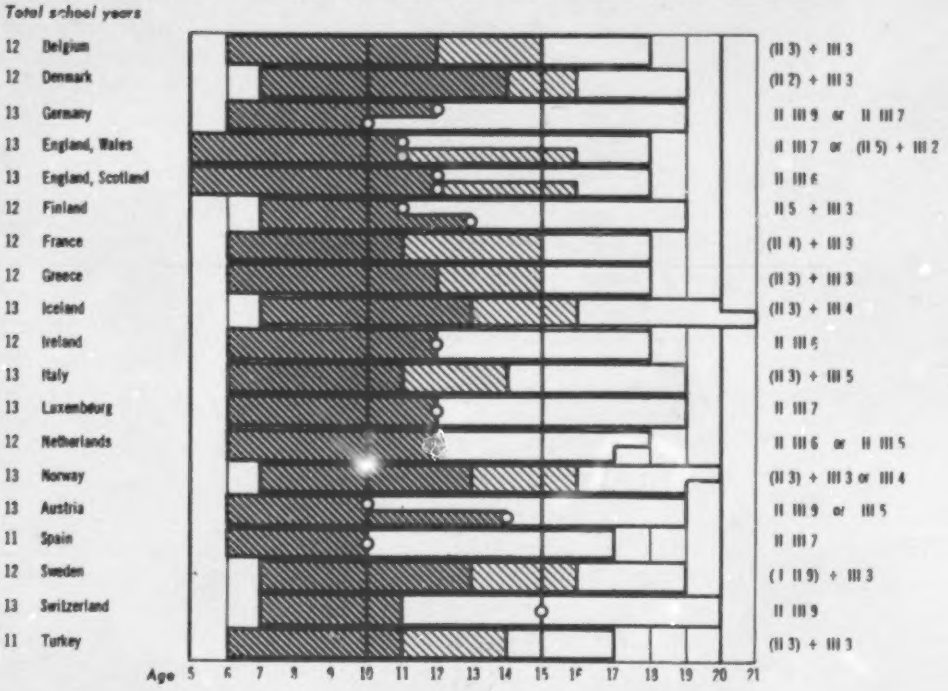
The birth rate in Austria has been rising steadily (from 100,000 live births in 1953, to 135,000 live births in 1963), a 35 per cent increase over this period. Although from the demographic point of view this is a desirable development - for which there are many parallels in Europe - it is of serious educational consequences for Austria in terms of the total number of school children. This is felt first by the primary schools and then subsequently by all other schools up to university level, although the latter will not be affected by this birth wave during the period under review (1965-75). It is quite obvious that this 35 per cent increase - even assuming that we are only making allowance for its purely demographic aspect - will lead to considerable expansion in the demand for classroom space, teachers and financial support.

Added to this purely demographic expansion will be the need to meet the requirements of extended schooling provided for in the School Organisation Act of 1962. This foresees

Graph 24. DURATION OF GENERAL COMPULSORY EDUCATION



Graph 25. SECONDARY SCHOOLS IN EUROPE - DURATION OF EDUCATION



extension of the period of compulsory schooling from 8 to 9 years. As from autumn 1965 our children will spend at least 9 consecutive years in school. In their ninth year of schooling they will either attend a polytechnic course (in preparation for a vocational school) or they will be at a secondary school. In addition, there is the fact that our general secondary schooling has been increased from 8 to 9 years, as well as the fact that many other types of schools (business schools, business academies,etc.) have had their courses extended by one school year. These provisions put up classroom, teacher and financial requirements very considerably, as detailed in Chapter V.

2. Compulsory school expansion and the magnitude of the resulting resource needs

On the basis of the facts already quoted an increase of approximately 30 per cent in the number of pupils is to be expected over the next ten years at general compulsory schools, including the polytechnic course (cf. Graph 26, which gives a general picture for all schools).

This means that already between 1965 and 1970, 3,835 more classes will be needed at public primary, upper primary and special schools (i.e.,15.9 per cent of the existing number in 1965).

Over the period 1965-75 the additional class requirements grow to 5,159 classes (i.e., 21.2 per cent of the existing number in 1965), and in neither case are the private schools taken into consideration.

Dipl. Ing. Schlesinger has calculated that if we are to build these classes (general compulsory schools without polytechnic courses) between 1965 and 1975,the cost would be 6,500 million Austrian Schillings. By slowing down the construction of gymnasiums and laboratories and giving priority to the essential classrooms the building costs might be brought down to 5,000 million Schillings, or 500 million Schillings annually for the next ten years.

The requirements for teachers specifically qualified for teaching at primary, upper primary and special schools indicated in Chapter V assumes that only every other teacher decides to retire at the statutory age of 60. On this basis Austria will be faced by 1969/70 with a total shortfall of 11,200 teachers, equivalent to an annual shortage of 2,[illegible]40. If we add to this total shortfall the present need for about 3,000 compulsory school teachers and compare this figure with the number of teachers offering their services, it can be seen that the estimated shortage of teachers with the necessary qualifications for teaching at primary, upper primary and special schools during the first 5-year period of the forecast will lie between 5,300 and 5,700. In the second 5-year period of the forecast the estimated shortage will be 3,650 to 4,900.

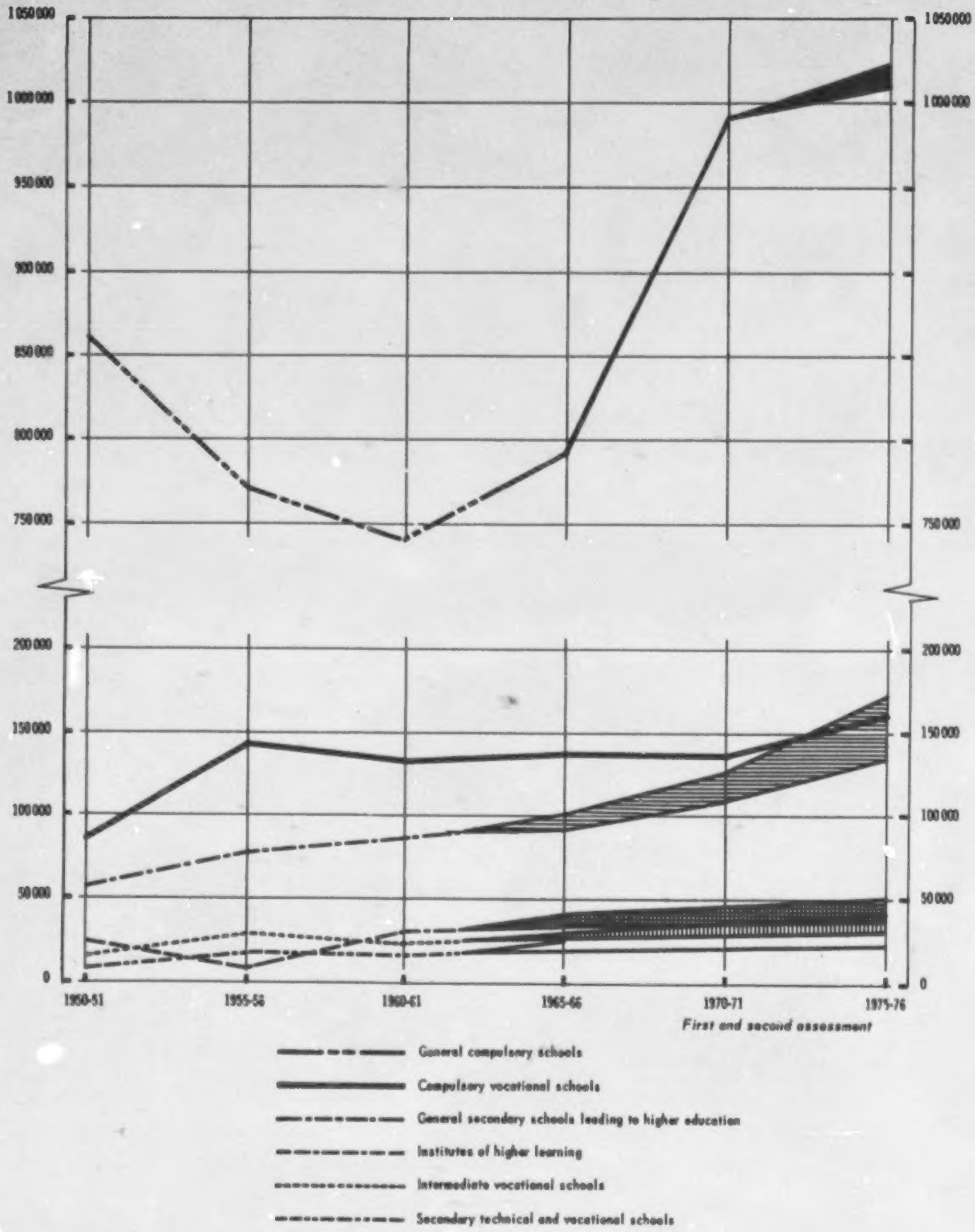
These figures,in broad outline, indicate the general magnitude of the problems for the future development of the compulsory level of education facing Austrian educational and financial authorities and the whole Austrian people.

3. Expansion at the secondary level

The development in schools leading to higher education leads to a consideration of two interrelated aspects of the demand of an industrialised society for more education: the so-called "social demand" and the demand of the economy for trained manpower.

Graph 26

ENROLMENT - NUMBER OF PUPILS



(a) The impact of social demand on enrolments

(i) The accelerating increase of social demand in industrial society

With respect to social demand for better educational opportunities the decisive factor is the family, especially the number of children. The United Kingdom's Robbins Report has shown(1) that the proportion of children reaching full-time higher education is four times as high for children from families with one or two children as from those where five or more children have claims on the family's resources. There is also a very important influence from the educational background of the parents.(2) Lord Robbins shows that the proportion of children born in 1940/41 reaching full-time higher education is eight times as high among children whose fathers continued their own education to the age of 18 or over as among those whose fathers left school under 16. And he continues: "these facts suggest that, just as since the war more children have stayed on at school for a full secondary education, so in turn more of their children will come to demand higher education during the 1970's. The demand for education therefore grows like a snowball."

This increased demand for education is also related to the change in professional structure, in that the more fathers and mothers do qualified work, the more they will look for better education for their children. At this point the business world - faced with the demand for higher productivity - enters the picture, adding to the network of pressures for more education.

Will the "pool of ability" among students soon run dry as a result of social demands for better educational facilities? The study of the Burgenland Region in Austria for this project(3) entitles us to concur with Lord Robbins when he says:

> "In short we think there is no risk that within the next twenty years the growth in the proportion of young people with qualifications and aptitudes suitable for entry to higher education will be restrained by a shortage of potential ability. The number who are capable of benefiting from higher education are a function not only of heredity but also of a host of other influences varying with standards of educational provision, family incomes and attitudes and the education received by previous generations. If there is to be talk of a pool of ability, it must be of a pool which surpasses the widow's cruse in the Old Testament,(4) in that when more is taken for higher education in one generation more will tend to be available in the next."

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(1) "Higher Education", Report of the Committee appointed by the Prime Minister under the Chairmanship of Lord Robbins 1961-63, London 1965.

(2) Cf. "Reserves of Mental Ability in the Burgenland", Psycho-Pedagogical Service of Austria, Austrian EIP Project, Vienna, 1965. ("Die Begabungsreserven des Burgenlandes", published by Pädagogisch-Pschologischer Dienst Österreichs, Osterreichisches EIP-OECD Projekt, Vienna, 1965).

Cf. also, Beer/Kutalek/Schnell: "Einfluss von Begabung und Umwelt auf die Schulleistung", Chapter on 'Familienleben, Einstellung zur Schule, Anzahl der Geschwister, Schulbildung der Eltern (Vaterberuf), Nachmittagsaufenthalt der Kinder' (Family Life, Attitude towards School, Number of Children in Family, Parents' Educational Background (and Father's Profession), Way the Children Spend their Afternoons). To be published by Verlag für Jugend und Volk, Vienna, probably 1967.

(3) Op.cit.

(4) 4th Kings, IV, 1-7.

(ii) The extent of social demand as measured by the Second Assessment

Our Second Assessment of future student enrolment in Austria tried to take social demand into account.(1) This assessment anticipated an enrolment increase in intermediate vocational schools from 100 in 1965 to 143 in 1975, and in intermediate schools for the training of teachers and educational assistants to 143 - 146 in 1975.

Social demand for education is particularly pronounced for secondary school facilities. According to our Second Assessment enrolment to general secondary schools in the period under review (1965-75) will increase by 68 per cent compared with 1965. In this connection the following Graphs 27 and 28 should be consulted, which show the trend up to 1965 and the expected increase expressed as a percentage of the total population of the age concerned.

The projected social demand for educational openings at vocational secondary schools is much more acute, increasing by 10.3 per cent from 1965 to 1975. There is already a backlog in this area. Table 90 indicates the number of entrance examinations that have been passed over the past few years as well as the number of children who had to be turned down (although they had passed the entrance examination!) because of shortage of space. In 1958/59 this reached a peak of 22.2 per cent.

Graph 28 illustrates the growth in the number of pupils at vocational intermediate and secondary schools between the school-years 1950/51, 1965/66 and 1975/76 expressed as a percentage of the whole population at any given age.

(iii) The implications for resource mobilisation

Future classroom space required is reported in Chapter V. Even if the present construction programme for schools is completely fulfilled we must anticipate a shortage of 814 classrooms in 1969/70 as far as intermediate and secondary public schools (federal schools) are concerned. No school building programme has yet been announced for the period 1969/70 - 1974/75. By the end of this period we shall require an additional 2,529 classrooms over and above the expected number available in 1969/70. If it is assumed that a vocational or a secondary school which today has twelve classes will need fourteen classes in the school-year 1969/70 and an average of fifteen classes in 1974/75, then it can be calculated that by 1969/70 a further 40, and by 1974/75 a further 112 new intermediate and secondary schools will have to be built.

The required capital expenditure from the state is estimated (by Cornelius O. van Dijk in Chapter V, including the cost of setting up Pedagogical Academies) at 6,556,600,000 Austrian Schillings over the period under review using 1963 prices as a basis for calculation.

Meeting teacher requirements will be an extremely serious problem for intermediate and secondary schools. In the period 1965/66-1969/70 we must expect a shortage of about 1,800 teachers with qualifications for teaching in secondary schools, and - if energetic countermeasures are not taken - this shortfall will have increased for this school category to 5,100 teachers by 1974/75. Diagram V illustrates the yearly increasing replacement needs (i.e., the growing number of retirements expected annually).

Also, as regards intermediate and secondary schools, there will in all probability be a considerable structural teacher-shortage. This must be studied conscientiously, because otherwise ordinary school-functioning at the present level will be endangered.

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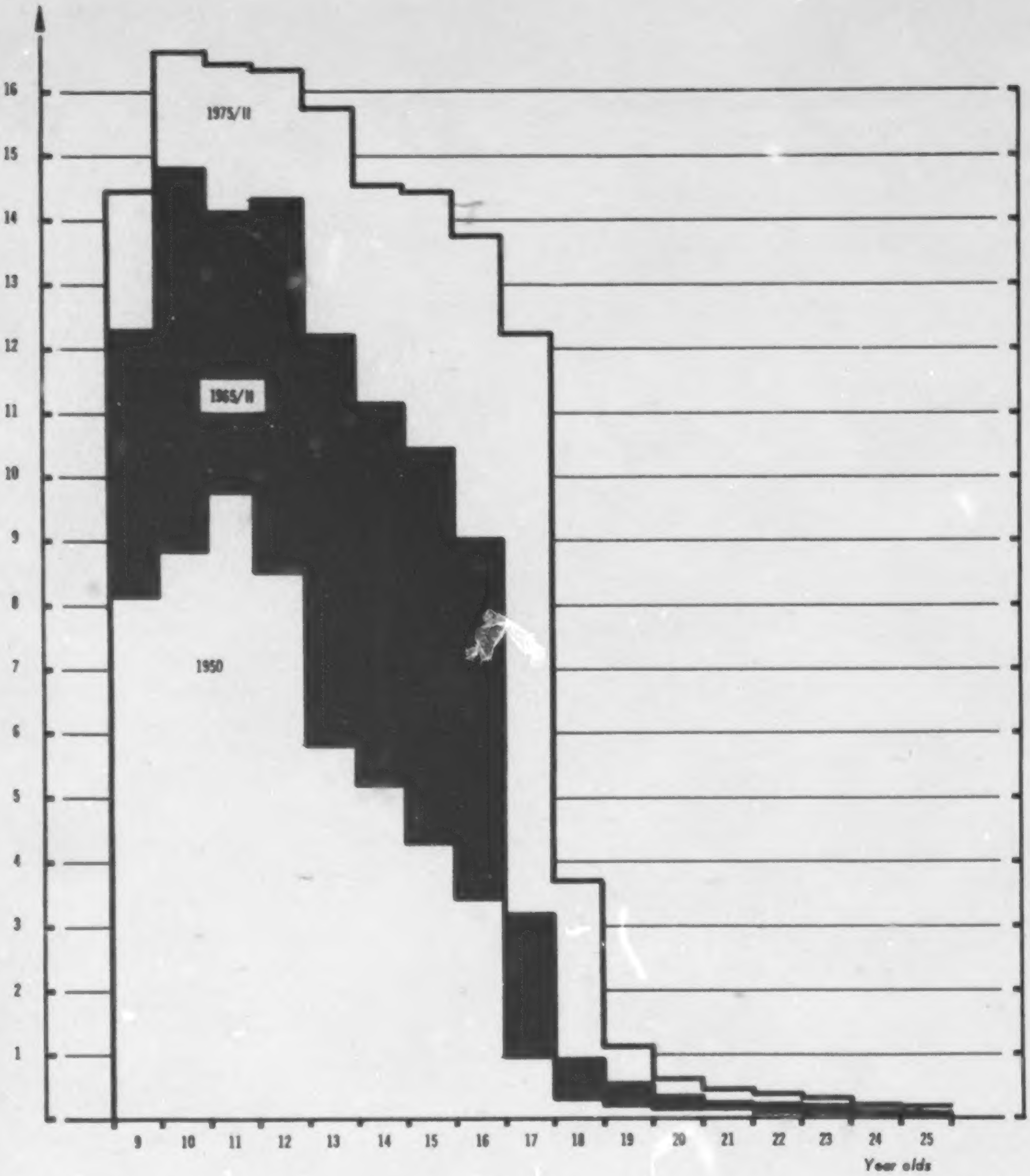
(1) Cf. Chapter 2, Section A3.

Graph 27

ENROLMENT COHORTS

Number of pupils in general secondary schools leading to higher education in the school years 1950/51, 1965/66 and 1975/76 as a percentage of the population in the corresponding age group

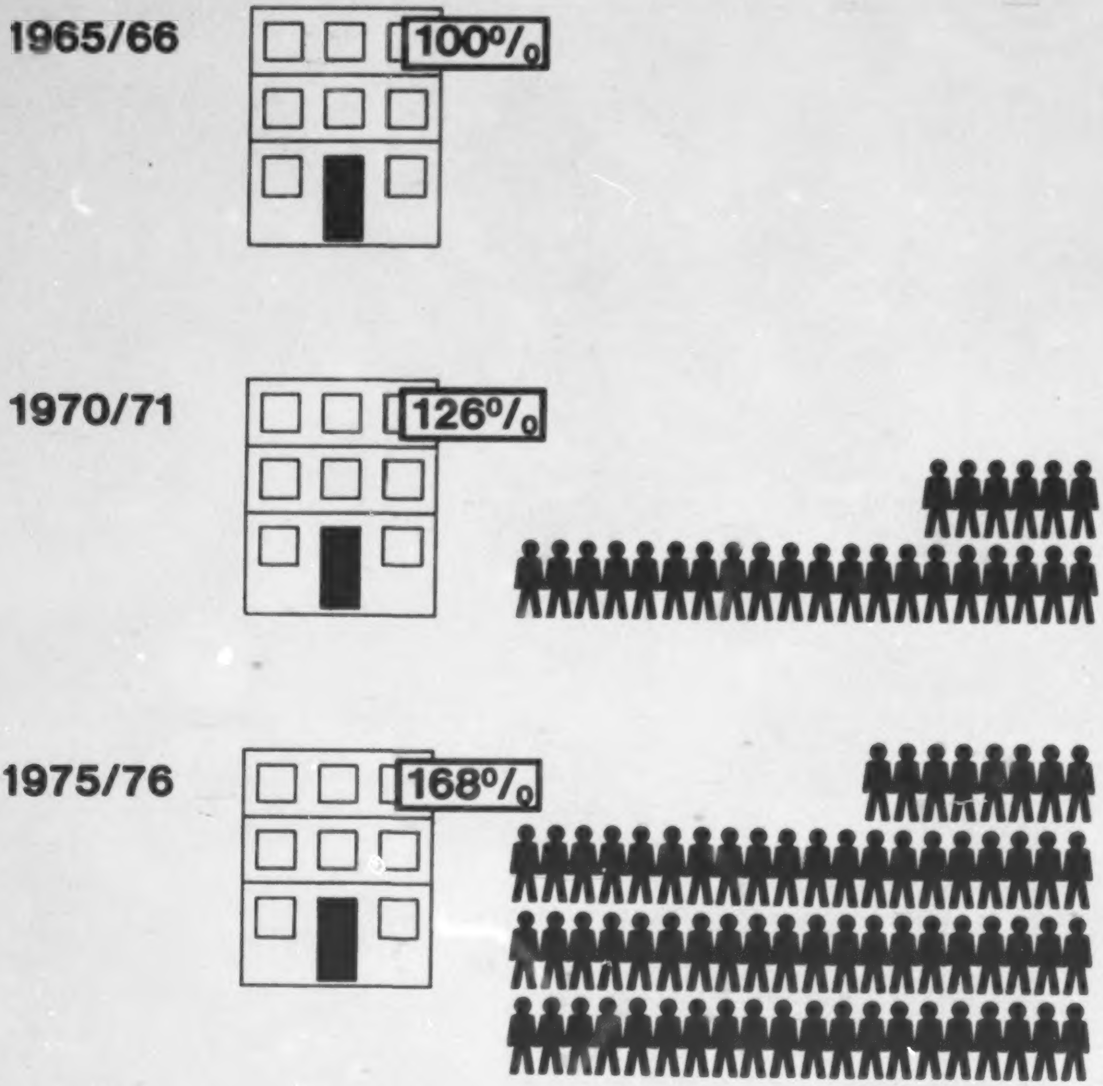


To be interpreted as follows :

In 1950 there were 9.7 % of Austrian children aged 12 years in general secondary schools leading to higher education.
1965 there will be 14.1 % and
1975 there will be 16.5 % of all Austrian children aged 12 years in general secondary schools leading to higher education.

Diagram III

MORE AND MORE PUPILS STAND AT THE DOORS OF AUSTRIAN GENERAL SECONDARY SCHOOLS LEADING TO HIGHER EDUCATION



	1965/66	1970/71	1975/76
General compulsory schools	100 %	124 %	129 %
Intermediate vocational schools	100 %	122 %	164 %
General secondary schools leading to higher education	100 %	126 %	168 %
Secondary technical and vocational schools	100 %	148 %	203 %
Institutes of higher learning	100 %	111 %	127 %

Table 90

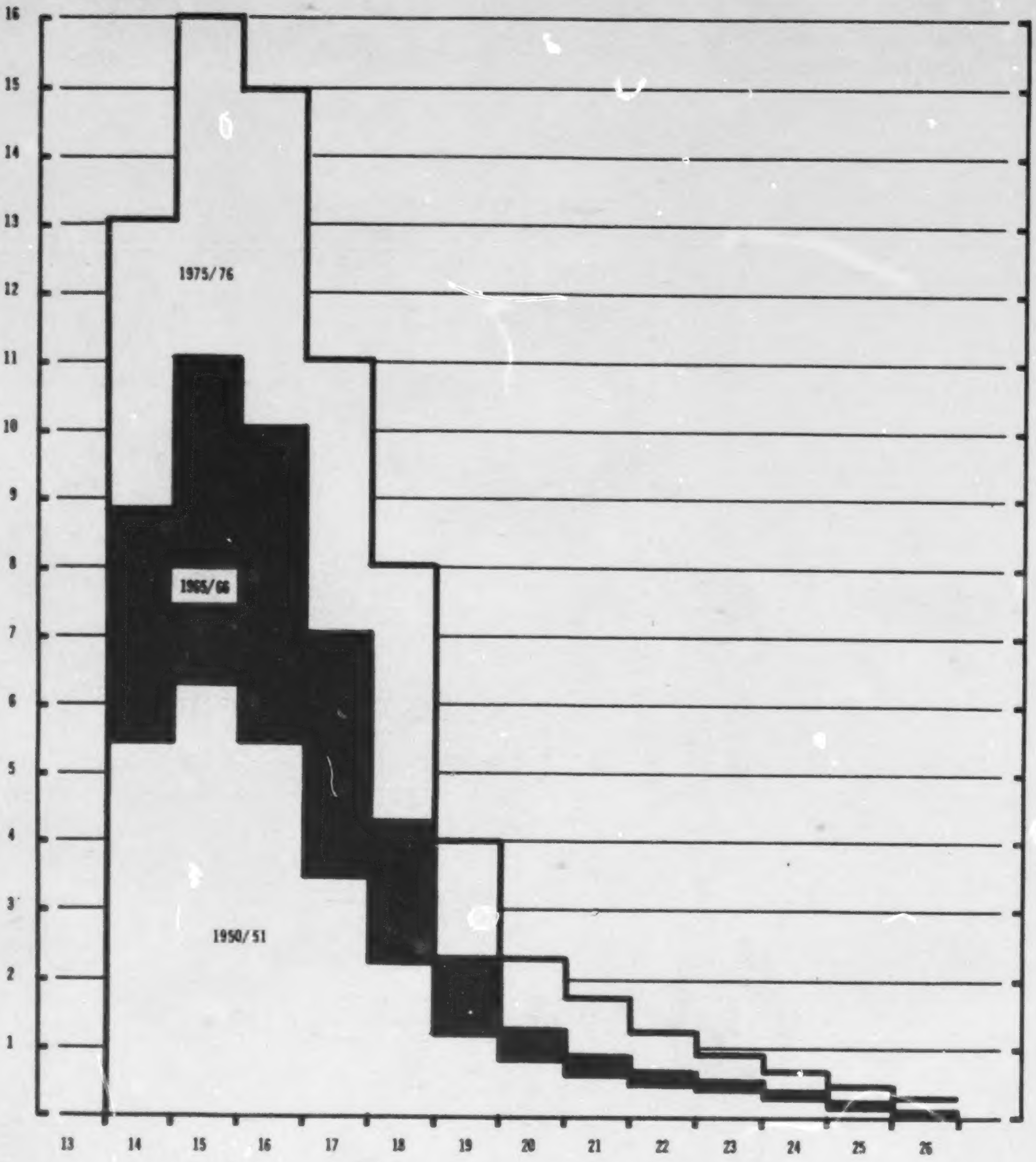
Applicants for admission to intermediate and secondary technical and trade schools

	Number of 14-year-olds	Application for entrance examination	Picked as suitable	In % of applicants	Accepted as first class	In % of applicants	Suitable, but rejected	In % of suitable
1955/56	128,900	6,479	4,476	69.0	3,788	84.6	688	15.4
1956/67	113,300	6,283	4,030	64.1	3,720	92.3	310	7.7
1957/58	107,600	7,527	4,405	67.4	3,936	89.3	469	2.7
1958/59	106,900	7,250	5,576	76.9	4,342	77.8	1,234	22.2
1959/60	89,100	6,128	4,417	72.0	4,126	93.4	291	6.6
1960/61	90,700	5,725	4,384	76.5	4,106	93.6	278	6.4
1961/62	105,600	6,069	4,777	78.7	4,376	91.6	401	8.4
1962/63	107,700	6,646	5,156	77.5	4,661	90.3	495	9.7
1963/64	102,900	6,291	4,930	78.3	4,749	96.3	181	3.7
1964/65	97,500	5,485	4,329	78.9	4,132	95.4	197	4.6

Graph 28

ENROLMENT COHORTS

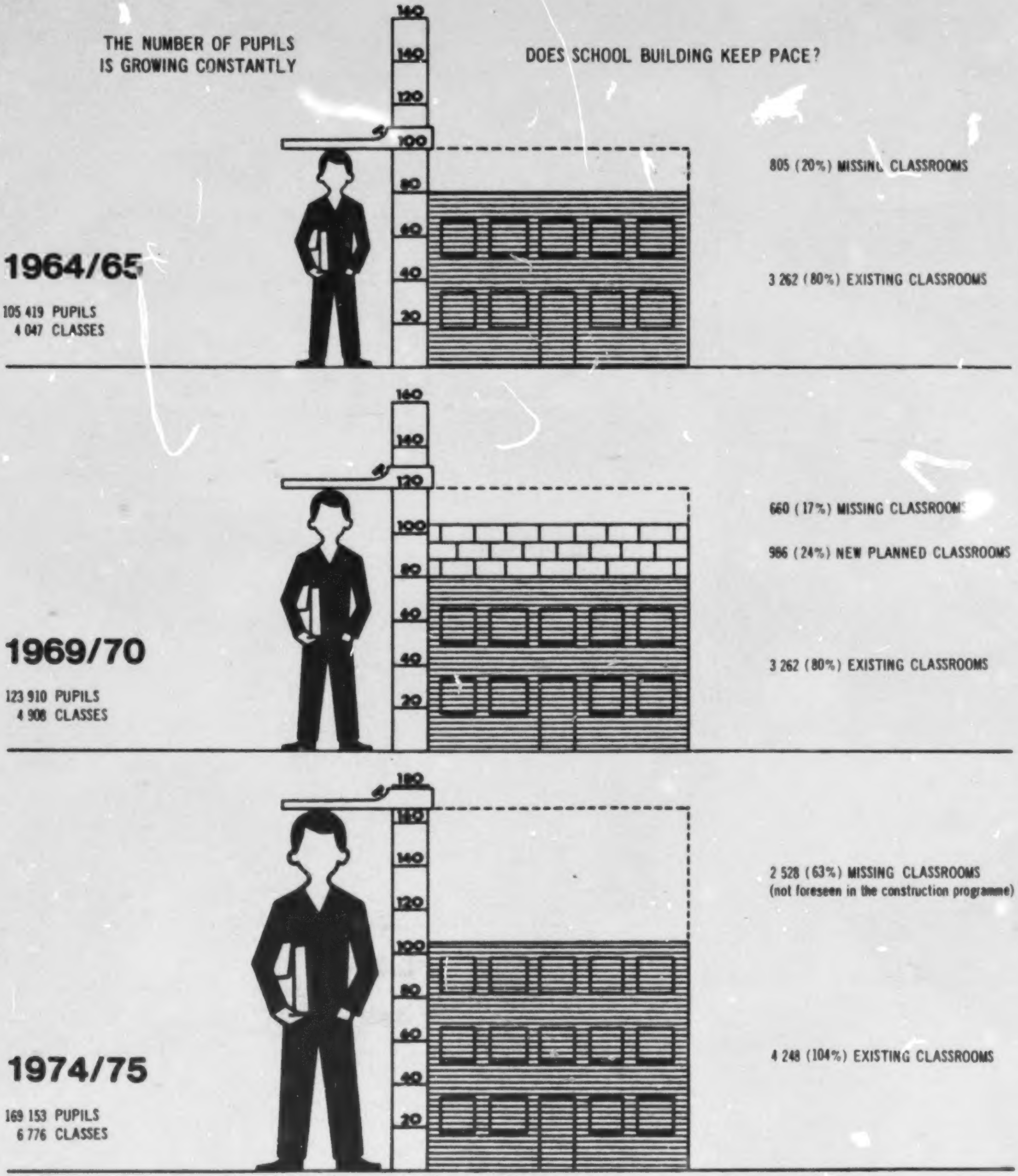
Number of pupils as a percentage of the total population in the respective age group
at intermediate vocational schools and secondary technical and vocational schools
1950/51, 1965/66, 1975/76/2nd assessment



See interpretation at the foot of Graph 27.

Diagram IV

THE GROWTH IN THE NUMBER OF PUPILS IN RELATION TO SCHOOLS SPACE



The uncertainty factor in establishing teacher-shortage is high partly because of an increasing shift towards the employment of women teachers. This inevitably leads to greater fluctuations.

The extent to which women teachers are now being employed ("The sex shift proportion") is demonstrated in the following pictorial diagrams (Diagrams VI and VII).

The expansion of education in Austria can be demonstrated by the increase in the numbers of 16-year-olds who have attended intermediate or secondary schools since 1950 and the estimated rise up to 1975. The following tables and graphs illustrate this increase. They show the actual numbers of 16-year-olds as well as the relative indices (1950 = 100).

Attention should be drawn finally to Graph 29 which shows the growth in the total number of the school and university population.

Table 91

Increase in the number of 16-year olds at school

(a) In absolute numbers, (b) In indices (1950/51 = 100)

		1950/51	1955/56	1960/61	1965/66	1970/71	1975/76
Compulsory vocational schools	(a)	20,794	[illegible]	33,860	34,631	35,874	43,067
	(b)	100	[illegible]	163	167	172	207
Intermediate vocational schools	(a)	2,838	[illegible]	5,323	6,657	7,127	9,885
	(b)	100	174	187	235	251	348
Intermediate schools for the training of teachers and educational assistants	(a)	153	271	335	509	551	663
	(b)	100	177	219	333	360	433
General secondary schools	(a)	3,818	5,365	9,290	10,780	12,503	16,685
	(b)	100	141	243	282	327	437
Secondary vocational and technical schools	(a)	1,909	3,754	3,912	3,440	5,551	7,798
	(b)	100	197	205	180	291	408
16-Year-olds	(a)	87,000	116,900	106,900	102,900	96,400	116,700
	(b)	100	134	123	118	111	134

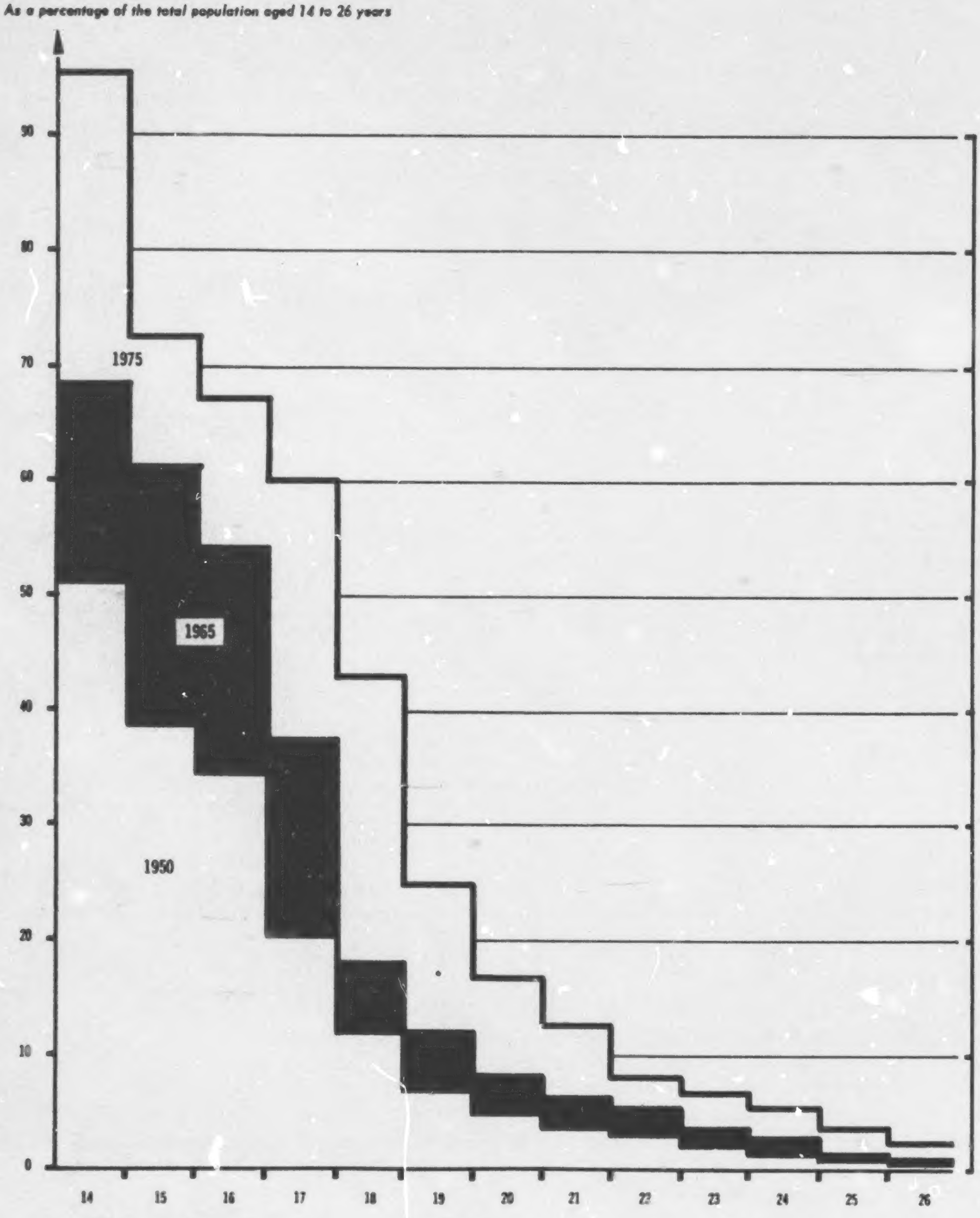
See Annex to Chapter II, Tables 13-24.

(b) The expansion of education in Austria and the manpower requirements, 1965-75

The secondary schools deliver the "raw material" for the universities. The vast majority of specialists for business and industry are recruited from those school-leavers with the "Matura" certificate who go straight into productive employment. It is therefore possible by examining the "Matura Balance" to determine whether the expected expansion of schooling and education in Austria will, or will not, be adequate to meet the demands of a changing and

Graph 29

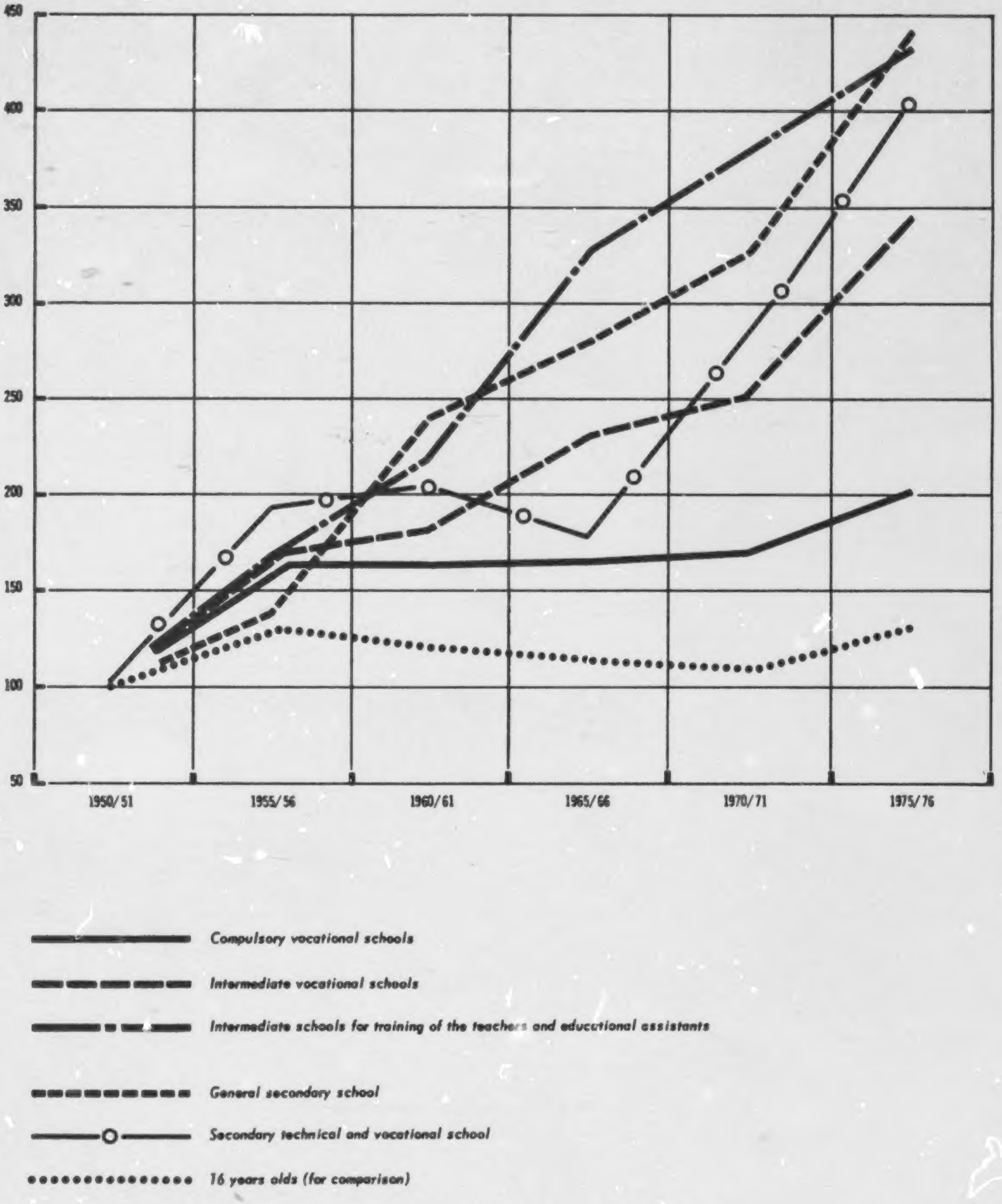
ENROLMENT COHORTS



100 % = all pupils of one age group.

Graph 30

INCREASE OF THE NUMBER OF 16 YEAR OLDS ATTENDING AUSTRIAN SCHOOLS
IN INDICES OF THE SCHOOL YEAR 1950/51



Graph 31

INCREASE OF THE PERCENTAGE OF 16 YEAR OLDS ATTENDING AUSTRIAN SECONDARY SCHOOLS

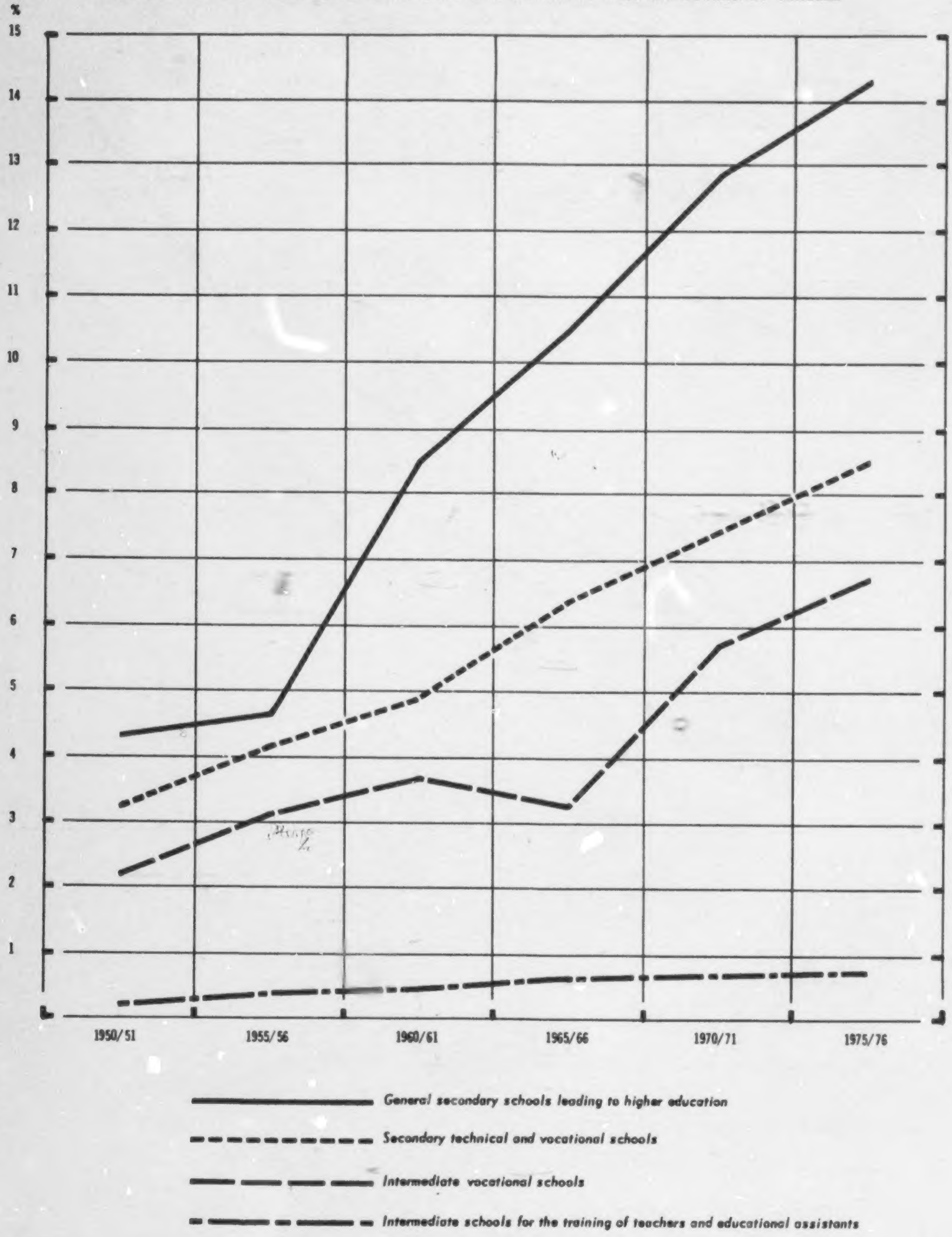


Diagram V

NUMBER OF TEACHERS WHO WILL RETIRE BETWEEN 1966 AND 1978

(YEAR AFTER YEAR MORE TEACHERS GO INTO RETIREMENT)

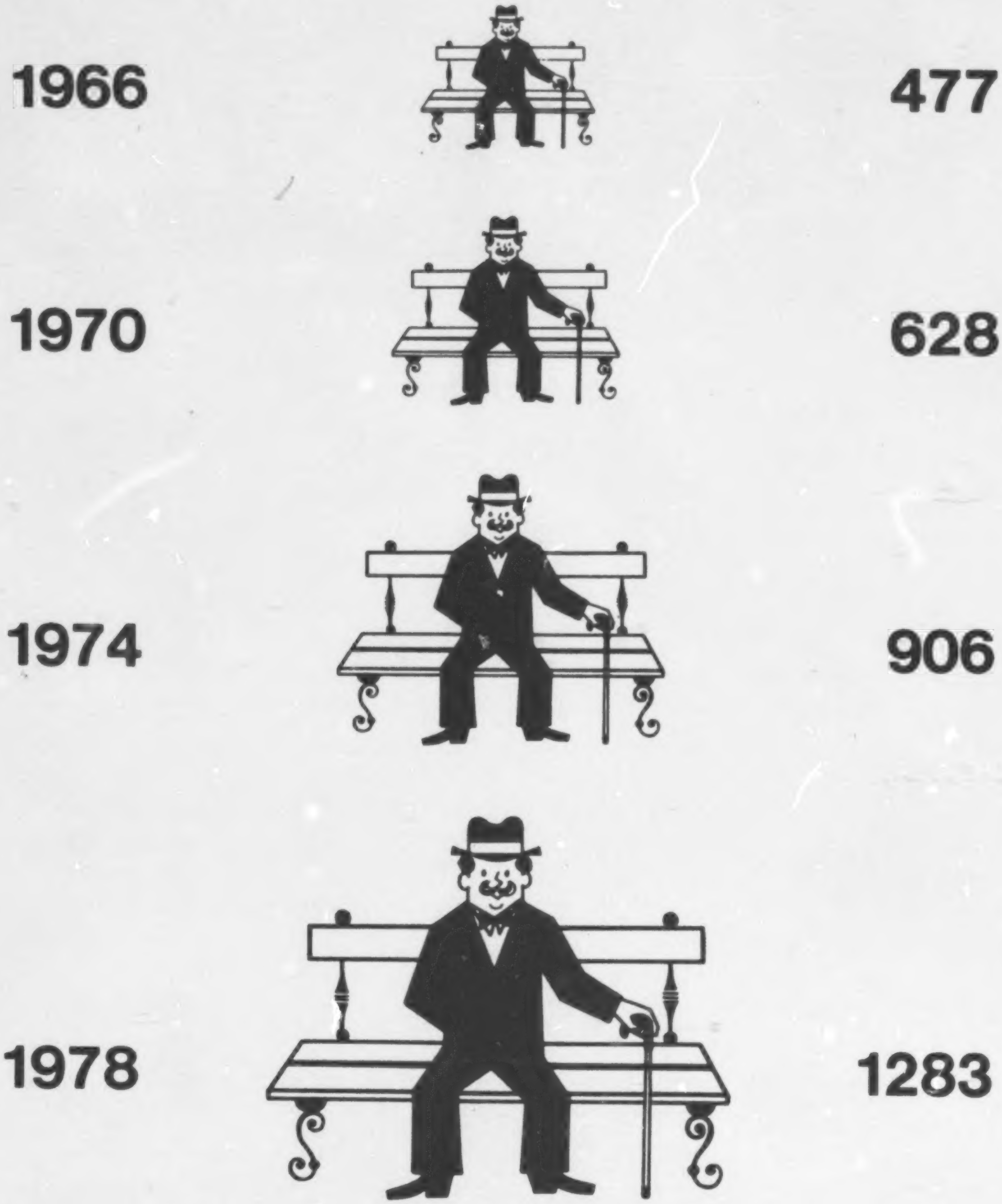


Diagram VI

MALE AND FEMALE TEACHERS BY AGE GROUP

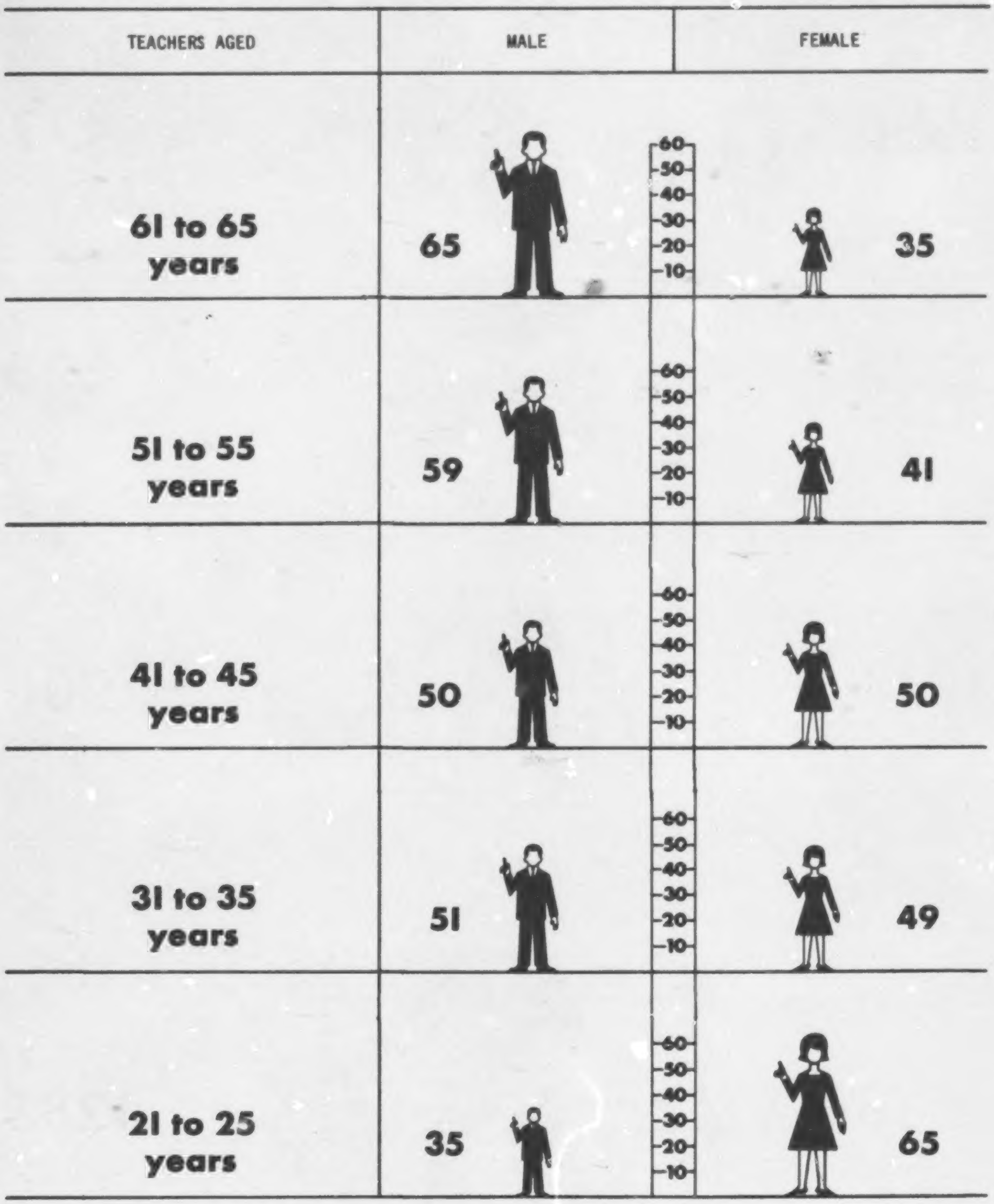
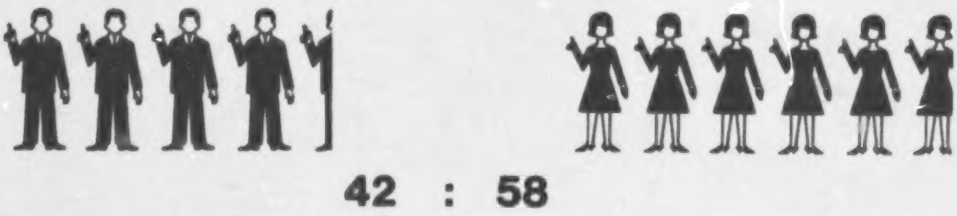


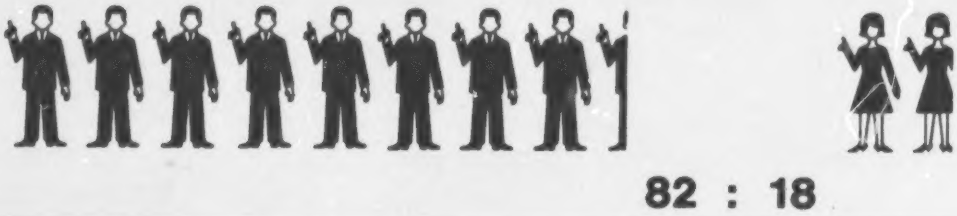
Diagram VII

MALE AND FEMALE TEACHERS AT DIFFERENT SCHOOL LEVELS

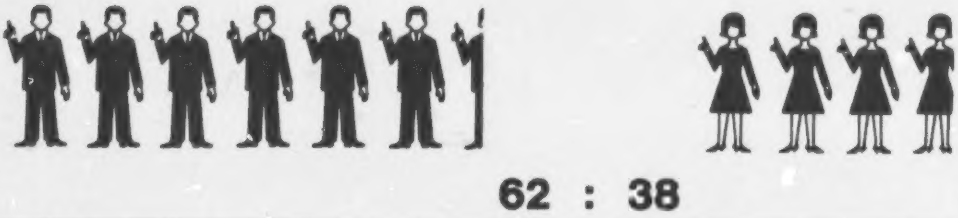
GENERAL COMPULSORY SCHOOLS



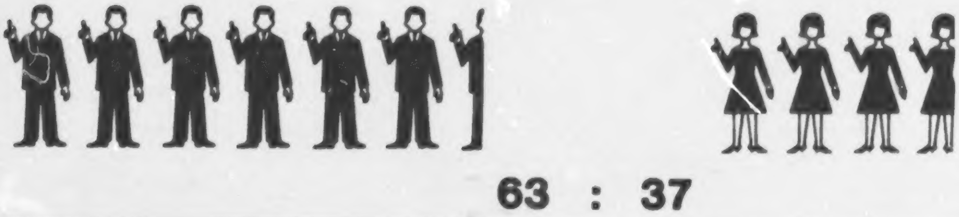
COMPULSORY VOCATIONAL SCHOOLS



GENERAL SECONDARY SCHOOLS



INTERMEDIATE VOCATIONAL SCHOOLS AND SECONDARY TECHNICAL AND VOCATIONAL SCHOOLS



expanding economy. The investigations by Dr. Josef Steindl of the Austrian Institute for Economic Research (cf. Chapter III) have shown that even by making an optimistic estimate of the output of school-leavers with Matura certificate - in other words, the estimate derived from our Second Assessment - the result falls a long way short of the needs of business and industry. This shows that not only does the direction of parents' demand for meeting "social educational requirements" correspond closely to the needs of business and industry for better-trained specialists, but it also demonstrates that the demands of business and industry far exceed this "social" demand outlined above. This is one of the most important results of our work. But first we intend to provide the relevant figures for this assertion.

In Chapter III Dr. Steindl made an assessment of the number of academically-trained persons needed between 1965 and 1980. From these figures he then deduced the number of school leavers with Matura certificates who should proceed to university studies. After taking into account the number of school-leavers with Matura certificates who would presumably go straight into business and industry and of those who would go on to university after first having attended a vocational secondary school, he deduced the following requirement figures:

Table 92

Comparison of demand of economy with probable output of school system - First and Second Assessment

School leavers with "Matura" certificate of the following schooltypes	1964/65-1968/69 Annual average			1969/70-1973/74 Annual average		
	Output according to First and Second Assessment	Demand of the economy	Deficit according to First and Second Assessment	Output according to First and Second Assessment	Demand of the economy	Deficit according to First and Second Assessment
General secondary school (without Mus.-pädagog.Rg.)	(I) 7,198 (II) 7,556	10,966	(I) 3,768 (II) 3,414	(I) 6,100 (II) 6,710	12,928	(I) 6,828 (II) 6,218
Secondary technical and vocational schools	(I) 2,872 (II) 3,354	5,153	(I) 2,281 (II) 1,799	(I) 2,988 (II) 4,602	6,632	(I) 3,644 (II) 2,030
Musisch-pädagogische Realgymnasien	(I) 1,444 (II) 1,548	2,400	(I) 956 (II) 859	(I) 1,948 (II) 2,260	2,820	(I) 872 (II) 560
Total	(I) 11,514 (II) 12,458	18,519	(I) 7,005 (II) 6,072	(I) 11,036 (II) 13,572	22,380	(I) 11,344 (II) 8,808

The total annual requirements of school-leavers with Matura certificate from schools leading up to a university course will be 18,519 between 1964/65-1968/69, 22,380 between 1969/70-1973/74, and 29,648 between 1975/76-1980. We have juxtaposed these figures against those of estimated output as obtained in our assessments. In doing so we kept separate the figures obtained by the First and Second Assessments, and calculated the difference between "Requirements of the Economy for School-Leavers with Matura Certificate" and expected "Output of School-Leavers with Matura Certificate". These figures are given in Table 92. In addition we have made a graph showing the Requirements of the Economy (Graph 32, 3rd Assessment) and our estimate of the probable "supply" of school-leavers with Matura certificates (1st and 2nd Assessments). This enables an easy comparison to be made.

Examination of Table 92 and Graph 32 shows that between 1964/65 and 1968/69 we shall be facing an annual deficit of between 6,000 and 7,000 school-leavers with Matura certificates. This deficit will rise between 1969/70 and 1973/74 to between 8,800 and 11,350 school-leavers with Matura certificates.

Graph 33 entitled "School-Leavers with Matura Certificates, as a Percentage of the Population in the Relevant Age Group" shows this relationship in another way. The last graph at this point then differentiates between the various types of school leading towards a university course (general secondary school, secondary technical and trade training establishments, business academies etc.) as regards their numbers of school-leavers with Matura certificates.

What deductions should responsible planners draw from the above observations? In 1965 the number of school-leavers with sufficient qualifications to start a course of university studies (i.e., those with the Matura certificate) was about 12,000. According to our Second Assessment this number will increase by about 50 per cent (to around 18,000) by 1975/76. Our economic expert (who is here expressing the views of the Austrian Institute for Economic Research) thinks that the number will have reached nearly 28,000 by 1975/76! We can therefore say with some degree of certainty that our estimate of 18,000 school-leavers with Matura certificates by 1975/76 is a minimum to be aimed at. Furthermore, from the point of view of business and industry, there is ample justification for making every effort to ensure not merely a 50 per cent increase over the next ten years but a doubling of the annual number of school-leavers with Matura certificates (to 24,000 annually) by 1975/76.

Nothing has been said yet, however, about the expansion necessary in the individual types of schools leading up to university education.

It is clear that it will be desirable to aim at a higher output of school-leavers with Matura certificates from vocational secondary schools than from general secondary schools. This can be judged from the amount of leeway to be made up by these schools, from our assessments and from the information supplied by Dr. Steindl (Chapter III).

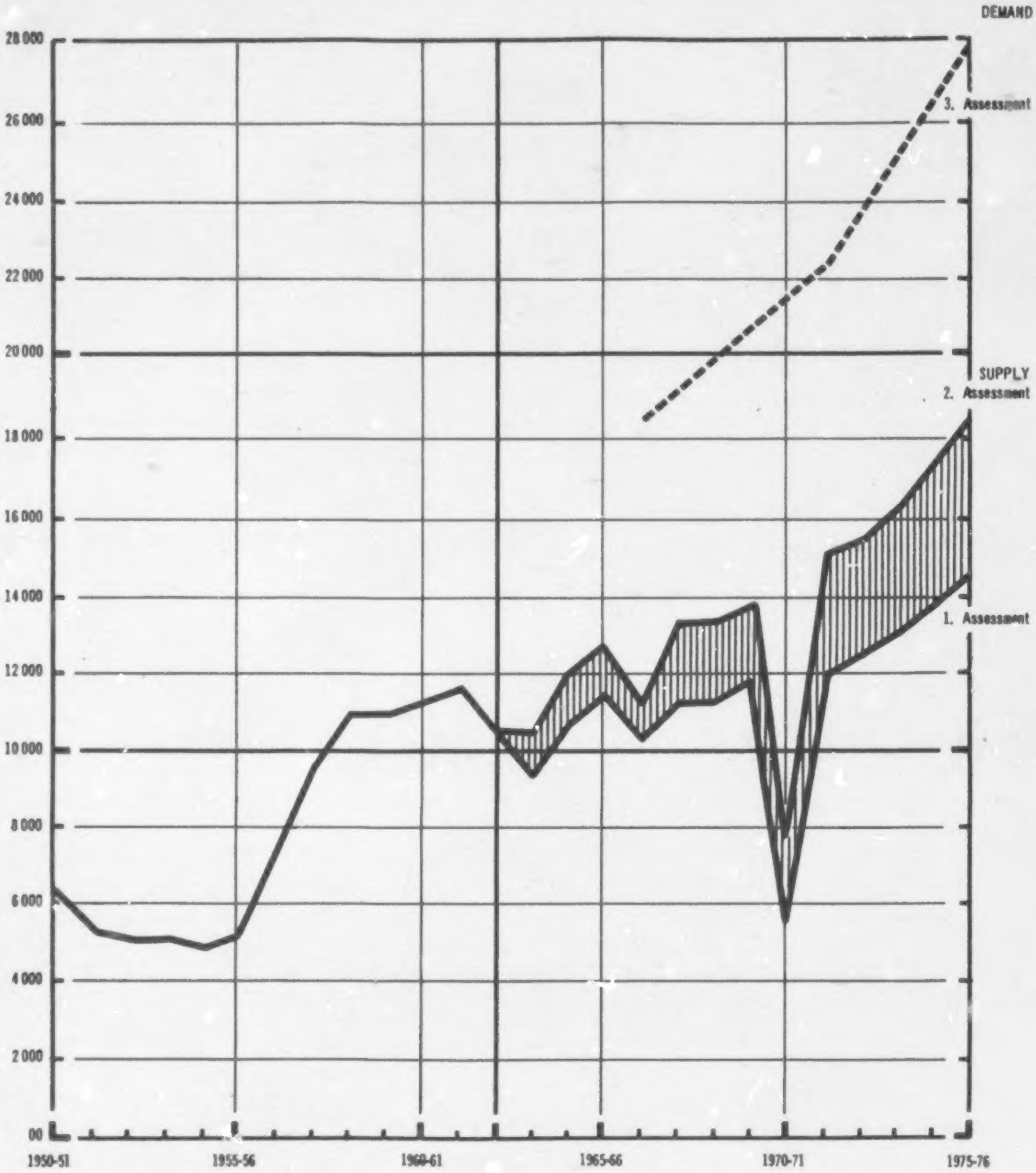
For the time being we do not consider it advisable to go into more detail about the requisite number of school-leavers with Matura certificates and the related figures of academic students. Our further investigations will have to make allowance for this phenomenon by observing economic development closely from year to year. What has to be stressed here, above all, is the enormous, and ever-increasing, social need (i.e., parents' demands for better educational openings for their children, coupled with the even greater demand of business and industry for better-trained specialists). This entitles us to state that our insistence on a 50 per cent increase in the output of school-leavers with the Matura certificates from general secondary schools and on a 100 per cent increase in the output of school-leavers with Matura certificates from vocational secondary schools over the period under review is quite justified by the facts.

A general picture of the expansion of schooling and education in Austria must take into account the following facts:

- This is not an isolated, or purely Austrian phenomenon, but much rather a development which we encounter everywhere in the world;
- This is not, as many people believe, a passing demographic development which is coming to the surface;

Graph 32

DEMAND AND SUPPLY OF SCHOOL LEAVERS WITH "MATURA" CERTIFICATES



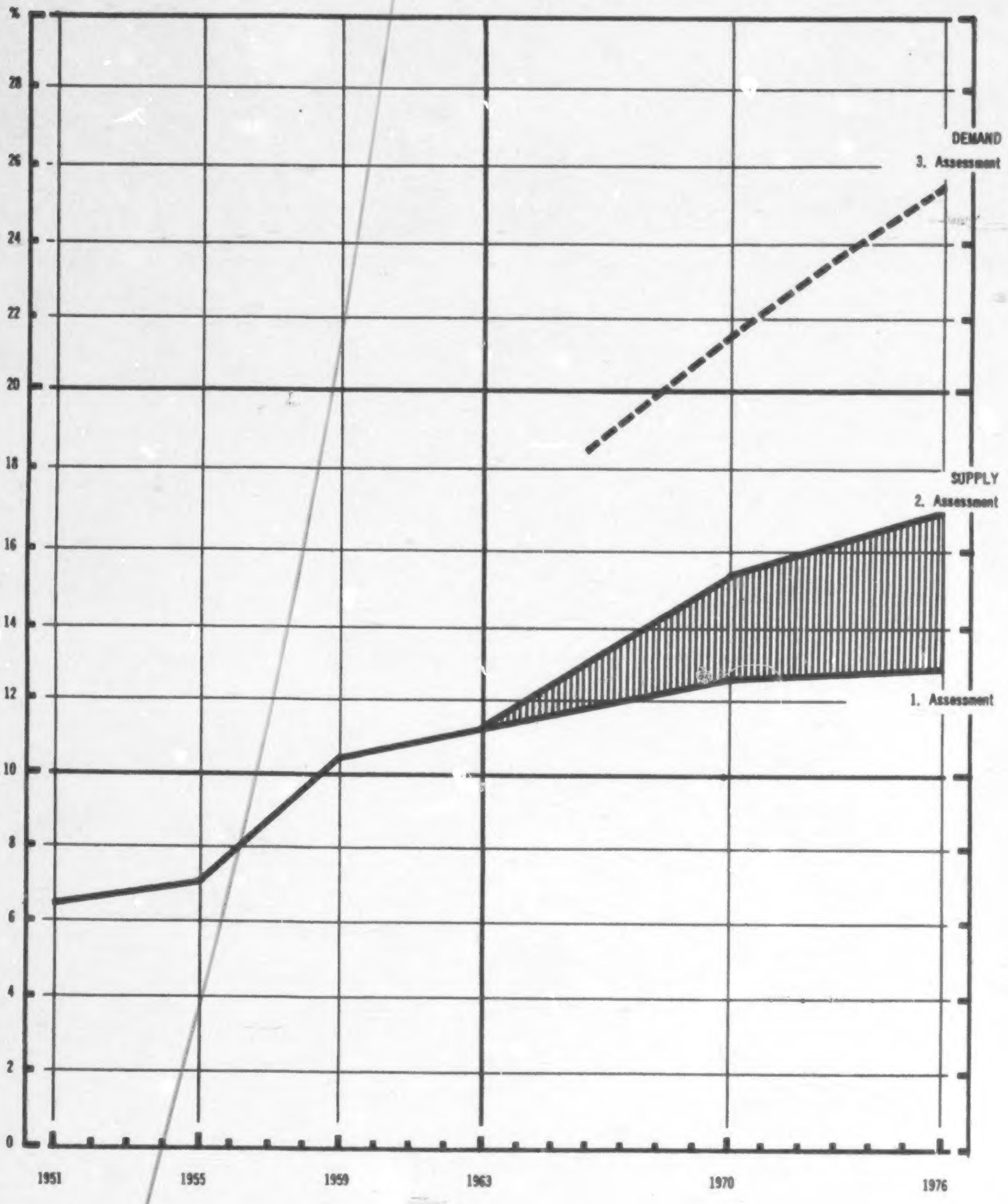
OUTPUT - Number of School leavers with "Matura" certificates.

Note : 1st and 2nd assessment, see Tables 13 to 24 of the Annex to Chapter II.

Demand assessment, see Table 39 of Chapter III.

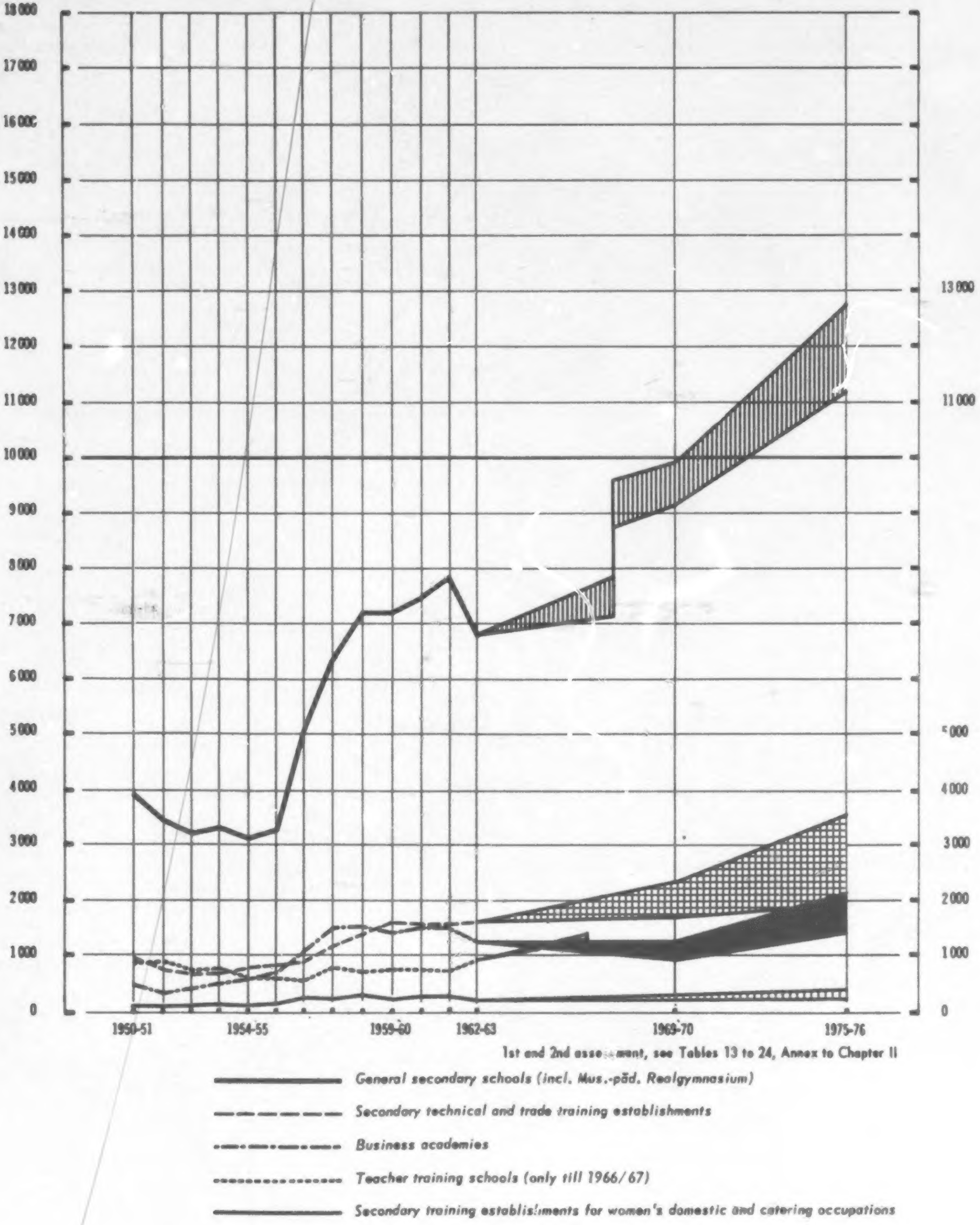
Graph 33

SCHOOL LEAVERS WITH "MATURA" CERTIFICATE
AS A PERCENTAGE OF THE POPULATION IN THE RELEVANT AGE GROUP



Graph 34

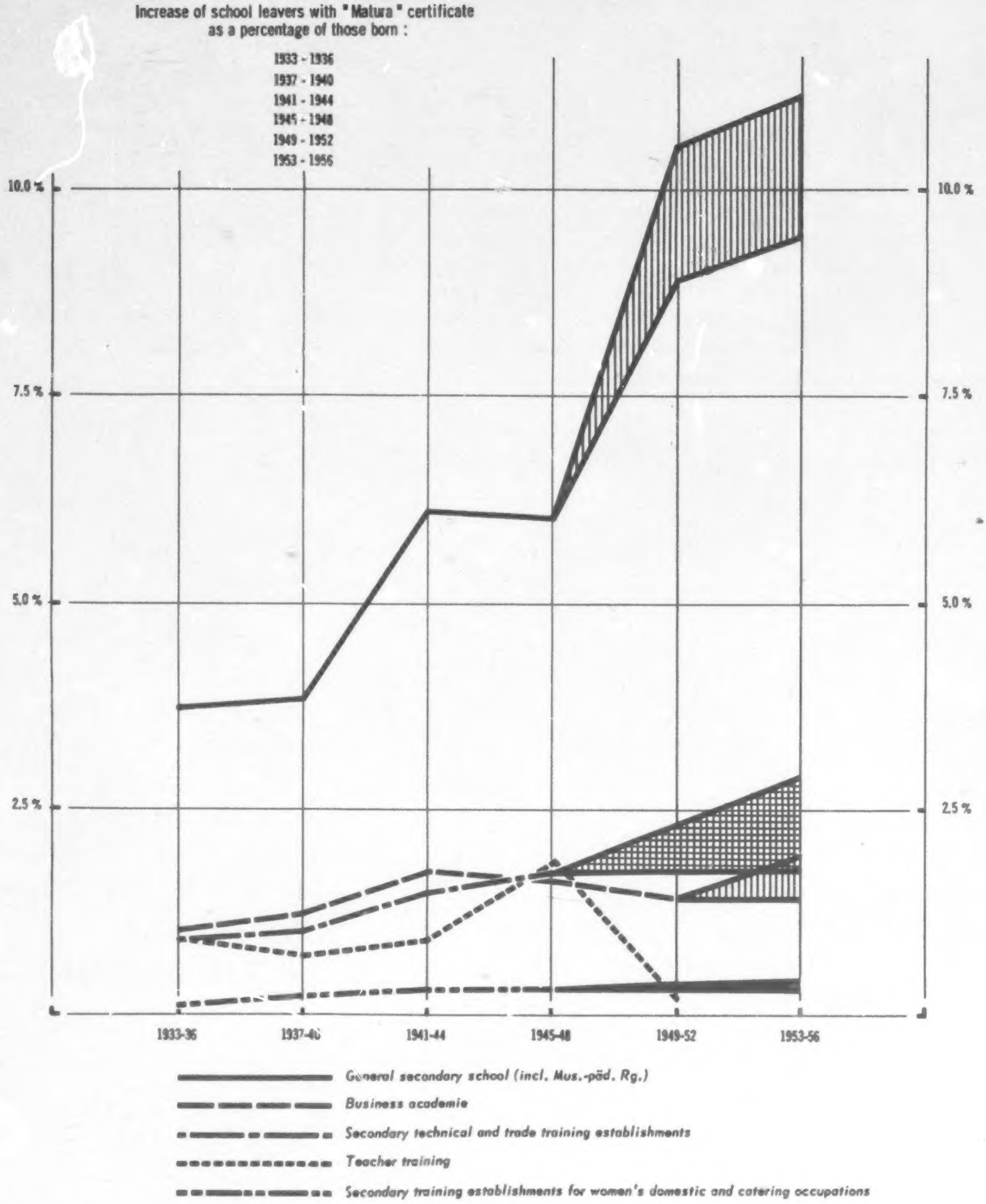
OUTPUT-NUMBER OF SCHOOL LEAVERS WITH "MATURA" CERTIFICATE



1st and 2nd assessment, see Tables 13 to 24, Annex to Chapter II

Graph 35

OUTPUT COHORTS



- Rather, this reflects that the social need for education resulting from major socio-economic changes has acquired proportions not hitherto appreciated in Austria; and
- The demands of business and industry for suitable Automation Age workers far exceed the "supply" produced so far (or likely to be produced during the period under review) by our system of schooling and education.

We are being faced with a basically new situation, with a situation which is characterised by the changes resulting from the second Industrial Revolution, or rather, by the beginning of these changes. We must try to meet the requirements of the new age. We must look these requirements in the face, calculate what they mean, and comply with them continuously. Above all we must take measures in plenty of time which will enable our system of schooling and education to cope with the ever-expanding demands made by society on the schools.

The measures that have to be taken should attract the interest of the whole Austrian population. We hope that the present investigation will serve to inform a wide section of the public. We consider that information of this sort is essential, since if the whole Austrian nation does not make a tremendous effort, we shall not be able to master the new situation with which we are all being faced.

ANNEX TO CHAPTER II

1. General Demographic Tables.

2. Enrolment, Output and Participation Tables (First and Second Assessments).

3. University Student Characteristics - Tables.

1. GENERAL DEMOGRAPHIC TABLES

Graph I

LIVE BIRTHS, 1920-1969

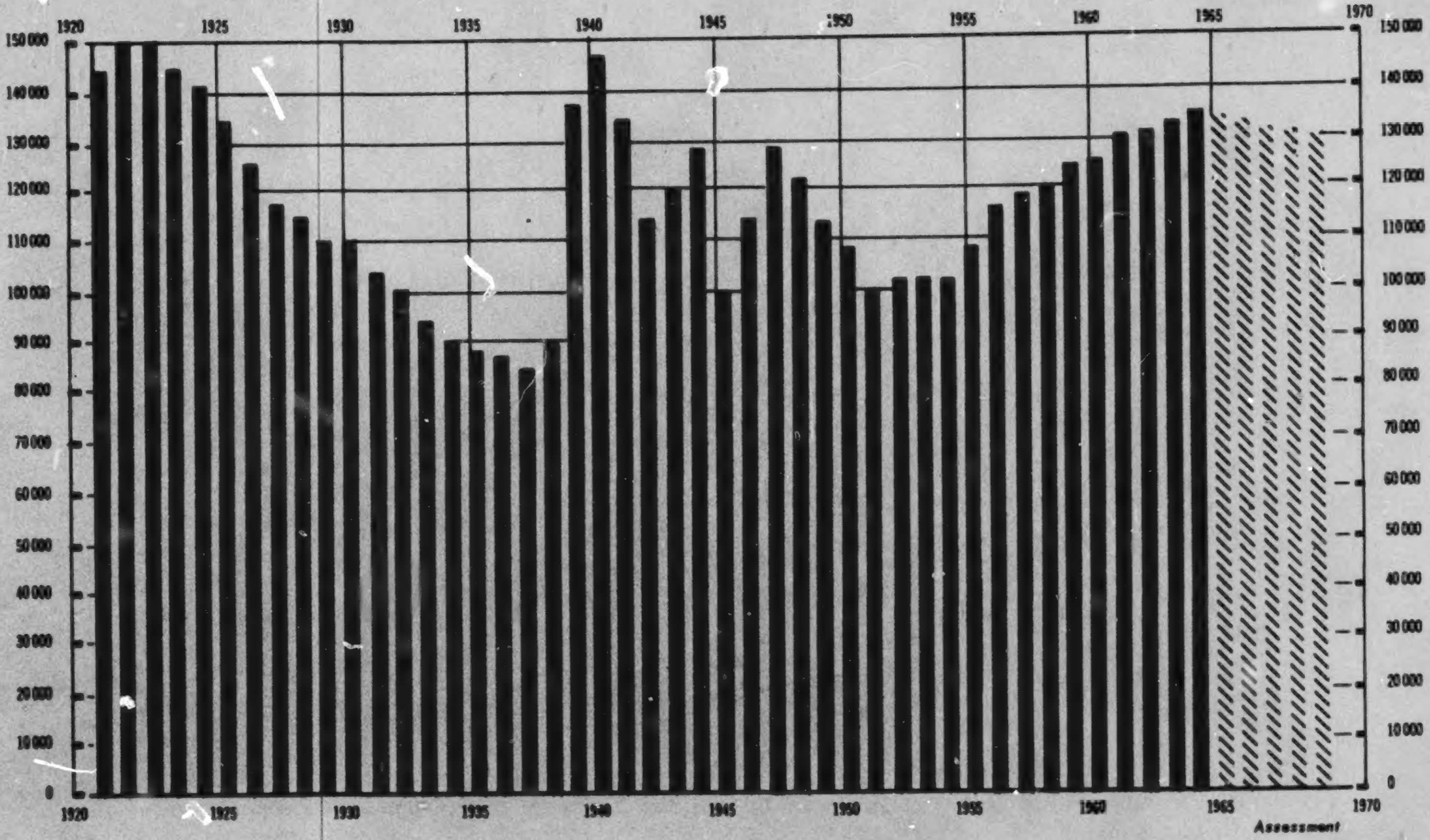


Table 1

Total population, marriages, live births, 1871-75, 1911-13, 1920-64

Year	Population	Marriages	Live births	Marriages per 1,000	Live births per 1,000
1871/75	4,646,037	40,111	160,447	8.6	34.5
1911/13	6,720,002	49,839	167,608	7.4	24.9
1920	6,454,800	85,866	146,644	13.3	22.7
21	6,503,567	81,223	151,138	12.5	23.2
22	6,527,708	74,274	150,958	11.4	23.1
23	6,543,325	56,594	146,885	8.6	22.5
24	6,561,672	52,845	142,141	8.1	21.7
1925	6,582,095	50,842	135,841	7.7	20.6
26	6,602,518	47,886	127,250	7.3	19.3
27	6,622,941	48,493	118,669	7.3	17.9
28	6,643,364	49,305	116,729	7.4	17.6
29	6,663,787	51,293	112,047	7.7	16.8
1930	6,684,210	51,583	112,330	7.7	16.8
31	6,704,633	49,717	106,324	7.4	15.9
32	6,725,056	45,356	102,277	6.7	15.2
33	6,745,479	43,902	96,369	6.5	14.3
34	6,754,979	43,979	91,567	6.5	13.6
1935	6,760,963	45,673	88,689	6.8	13.1
36	6,758,198	46,293	88,264	6.8	13.1
37	6,755,337	46,289	86,351	6.9	12.8
38	6,753,413	89,994	93,812	13.3	13.9
39	6,652,720	117,078	137,825	17.6	20.7
1940	.	78,204	145,926	.	.
41	.	56,323	135,398	.	.
42	.	52,504	116,172	.	.
43	.	48,588	122,443	.	.
44	.	41,107	126,938	.	.
1945	.	31,363	101,369	.	.
46	7,000,000	62,791	111,302	9.0	15.9
47	6,920,107	75,484	128,953	10.9	18.6
48	6,952,744	71,904	123,221	10.3	17.7
49	6,942,500	68,974	113,375	9.9	16.3
1950	6,935,100	64,621	107,854	9.3	15.6
51	6,933,905	63,167	102,764	9.1	14.8
52	6,927,800	57,571	103,012	8.3	14.9
53	6,932,500	54,202	102,867	7.8	14.8
54	6,940,200	54,289	103,985	7.8	15.0
1955	6,946,900	56,689	108,575	8.2	15.6
56	6,952,400	57,383	115,827	8.3	16.7
57	6,965,900	56,510	118,712	8.1	17.0
58	6,987,400	55,407	119,755	7.9	17.1
59	7,014,300	55,5[illegible]	124,377	7.9	17.7
1960	7,047,500	58,508	125,945	8.3	17.9
61	7,073,807	60,001	131,563	8.5	18.6
62	7,129,900	59,705	133,253	8.4	18.7
63	7,172,100	58,415	134,809	8.1	18.8
64	7,215,400	57,533	133,841	8.0	18.5

Table 2

Total population of Austrian 5-to 29-year olds without reference to emigration and immigration, 1950-1975

Population as of September 1st, (in thousands)

Age (1)	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962
5	89.5(2)	90.8	106.2	109.1	106.0	98.2	95.3	94.9	95.7	97.4	100.8	107.7	112.3
6	107.1	89.5	90.8	106.1	109.1	106.0	98.2	95.3	94.9	95.7	97.4	100.8	107.7
7	108.5	107.0	89.4	90.8	106.0	108.5	105.0	98.1	95.0	94.7	95.6	97.3	100.8
8	114.7	108.5	107.0	89.4	90.8	105.9	108.4	104.5	98.0	94.9	95.4	95.4	97.2
9	130.4	114.7	108.3	107.0	89.3	90.8	105.9	108.3	104.0	97.9	94.8	94.4	95.4
10	135.6	130.4	114.3	108.2	107.0	89.2	90.8	105.9	108.2	103.5	97.7	94.7	94.3
11	118.6	135.5	129.9	114.0	108.0	107.0	89.2	90.8	105.9	108.1	130.0	97.7	94.6
12	86.6	118.6	135.4	129.5	113.7	107.9	107.0	89.2	90.8	105.8	107.9	103.0	97.6
13	83.2	88.5	118.2	135.0	129.2	113.5	107.8	107.0	89.1	90.7	105.7	107.8	102.9
14	84.1	83.1	88.1	117.7	134.6	128.9	113.3	107.6	106.9	89.1	90.7	105.6	107.7
15	84.7	84.1	82.7	87.7	117.3	[illegible]	128.6	113.1	107.6	106.9	89.0	90.7	105.5
16	87.0	84.7	83.6	82.3	87.2	116.9	133.9	128.3	112.9	107.5	106.9	88.9	90.6
17	90.1	87.0	84.0	82.9	81.7	86.7	116.5	133.5	128.1	112.8	107.4	106.9	88.8
18	93.0	90.0	86.0	83.4	82.2	81.2	86.3	116.2	133.3	127.9	112.7	107.4	106.7
19	95.6	92.9	89.3	85.4	82.9	81.7	80.8	86.0	115.9	133.0	127.8	112.6	107.2
20	98.1	95.5	92.2	88.7	84.7	82.3	81.1	80.3	85.7	115.6	132.9	127.6	112.4
21	97.1	98.0	94.9	91.6	88.1	84.0	81.7	80.6	80.0	85.3	115.5	132.8	127.4
22	97.6	97.0	97.4	94.3	90.9	87.4	83.2	81.1	80.0	79.5	85.1	115.4	132.6
23	97.6	97.5	96.5	96.9	93.7	90.2	86.8	82.5	80.4	79.3	79.0	84.9	115.2
24	99.4	96.6	97.0	96.0	96.3	93.1	89.6	86.2	81.8	79.4	78.8	78.7	84.8
25	102.1	99.2	96.1	96.4	95.5	95.7	92.5	88.9	85.5	81.1	78.6	78.1	78.6
26	102.1	102.0	99.0	95.6	95.9	95.0	95.2	91.9	88.2	84.8	80.5	77.9	78.0
27	104.9	102.6	102.0	98.5	95.1	95.4	94.5	94.6	91.3	87.6	83.9	79.8	77.8
28	105.9	104.9	102.2	101.4	97.9	94.6	94.9	94.0	94.0	90.7	86.9	83.3	79.7
29	103.9	105.8	104.5	101.8	101.0	97.6	94.3	94.6	93.6	93.6	90.2	86.6	83.2

(1) Age - completed years of age.

(2) Read as follows: on September 1, 1950, there were 89,500 male and female persons aged 5 in Austria.

Table 2 (continued)

1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	Age
113.8	117.5	120.1	124.4	127.[illegible]	129.1 (1)	129.2	128.6	127.7	126.8	125.9	125.6	125.0	5
112.2	113.8	117.5	120.1	124.4	127.5	129.1	129.2	128.5	127.7	126.8	125.9	125.6	6
107.6	112.1	113.7	117.4	120.0	124.3	127.4	129.0	129.1	128.4	127.6	126.7	125.8	7
100.7	107.5	112.1	113.7	117.4	119.9	124.2	127.3	128.9	129.9	128.3	127.5	126.6	8
97.1	100.6	107.4	112.0	113.7	117.3	119.8	124.1	127.2	128.8	128.9	128.2	127.5	9
95.3	97.0	100.6	107.4	112.0	113.6	117.2	119.7	124.0	127.2	128.7	128.8	128.2	10
94.2	95.3	97.0	100.5	107.3	111.9	113.6	117.1	119.6	123.9	127.1	128.6	128.7	11
94.5	94.2	95.3	96.8	100.4	107.2	111.9	113.5	117.0	119.5	123.9	127.0	128.5	12
97.6	94.4	94.1	95.3	96.7	100.3	107.2	111.8	113.4	116.9	119.5	123.8	126.8	13
102.9	97.5	94.3	94.1	95.2	96.6	100.3	107.1	111.7	113.3	116.8	119.4	123.6	14
107.6	102.9	97.5	94.2	94.0	95.1	96.5	100.3	107.1	111.7	113.3	116.8	119.4	15
105.4	107.6	102.9	97.4	94.1	93.9	94.9	96.4	100.1	106.9	111.5	113.1	116.7	16
90.5	105.4	107.5	102.9	97.3	94.0	93.9	94.8	96.3	100.0	106.8	111.4	113.0	17
88.8	90.4	105.3	107.4	102.8	97.3	93.9	93.8	94.7	96.1	99.9	106.7	111.4	18
106.6	88.7	90.3	105.2	107.4	102.8	97.3	93.8	93.7	94.6	96.0	99.8	106.6	19
107.1	106.5	88.6	90.2	105.1	107.3	102.7	97.2	93.7	93.6	94.5	95.9	99.6	20
112.3	107.0	106.4	88.5	90.1	105.0	107.2	102.7	97.1	93.6	93.5	94.4	95.7	21
127.3	112.2	106.9	106.3	88.4	90.0	104.9	107.1	102.6	97.0	93.4	93.3	94.2	22
132.5	127.2	112.0	106.8	106.2	88.3	89.9	104.8	107.0	102.5	96.8	93.3	93.2	23
115.1	132.3	127.0	111.9	126.7	106.1	88.2	89.8	104.7	106.8	102.4	96.6	93.1	24
84.7	114.9	132.1	126.8	111.8	106.6	106.0	88.1	89.7	104.6	106.7	102.3	96.5	25
78.5	84.6	114.8	131.9	126.7	111.7	106.5	105.9	88.0	89.6	104.4	106.6	102.2	26
77.9	78.4	84.5	114.6	131.8	126.6	111.6	106.4	105.8	87.8	89.4	104.3	106.5	27
77.7	77.8	78.3	84.4	114.5	131.7	126.4	111.5	106.3	105.7	87.7	89.3	104.1	28
79.6	77.6	77.7	78.2	84.3	114.4	131.5	126.3	111.4	106.2	105.6	87.6	89.1	29

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(1) Read as follows: on September 1, 1968, there will be 129,100 male and female persons aged 5 in Austria. The calculation was carried out by Mr. Roland Jelinek and Mr. Ernst Niederheim under the supervision of Mr. W. Hofrat and Dr. Frans Haupt. They used the material supplied by the Austrian Central Bureau of Statistics.

2. ENROLMENT, OUTPUT AND PARTICIPATION TABLES

(First and Second Assessments)

Table 3a

First Assessment: Total enrolment in Austrian schools (and institutions of higher education) by types of school(x)

		Index 100 = 1950/51						Index 100 = 1965/66		
		1950/51	1955/56	1960/61	1965/66	1970/71	1975/76	1965/66	1970/71	1975/76
1. General compulsory schools	N	866.600	764,221	744,208	793,122	981,649	1,029,321	793,122	981,649	1,029.321
	%	100	88	86	92	113	119	100	124	130
2. Compulsory vocational schools	N	86.371	146.958	133,755	138.432	136,492	163,544	138.432	136.492	163,544
	%	100	170	155	160	158	189	100	99	118
3. Intermediate vocational schools	N	14,750	25,690	24,550	25,061	27,921	33,667	25,061	27.921	33,667
	%	100	174	166	170	189	228	100	111	134
4. Intermediate schools for the training of teachers and educational assistants	N	782	1,132	1,274	2,142	2,538	3,060	2,142	2,538	3,060
	%	100	145	163	274	325	391	100	118	143
5. General secondary schools (1)	N	59,379	84,593	88,811	96.147	116,129	142,949	96,147	116,129	142,949
	%	100	142	150	162	196	241	100	121	149
6. Secondary technical and vocational schools	N	9,469	16,521	18,930	17,656	20,327	25,749	17.656	20,327	25,749
	%	100	174	200	186	215	272	100	115	146
7. Schools for higher social occupations	N	-	-	-	75	133	230	75	133	230
	%	-	-	-	100	177	307	100	177	307
8. Teacher training colleges, schools for vocational school teachers (2)	N	-	-	116	971	4,276	5,243	971	4.276	5,243
	%	-	-	100	837	3,686	4,520	100	440	540
9. Institutions of higher education (3)	N	20,309	14,809	28,159	38,575	40.845	39.765	38,575	40,845	39,765
	%	100	73	130	190	201	196	100	106	103

(1) Including secondary schools for the training of teachers.

(2) .. and courses for secondary school graduates at the expiring secondary schools for the training of teachers.

(3) Universities, colleges and art academies.

(x) See note following Table 50, First Assessment, for detailed breakdown of school types covered.

Table 3b

Second Assessment: Total enrolment in Austrian schools (and institutions of higher education) by types of school

		Index 100 = 1950/51						Index 100 = 1965/66		
		1950/51	1955/56	1960/61	1965/66	1970/71	1975/76	1965/66	1970/71	1975/76
1. General compulsory schools	N	866,600	764,221	744,208	789.186	979.409	1,020,308	789,186	979.409	1,020,308
	%	100	88	86	91	113	118	100	124	129
2. Compulsory vocational schools	N	86,371	146,958	133,755	138,432	136,492	163,544	138,432	136,492	163,544
	%	100	170	155	160	158	189	100	99	118
3. Intermediate vocational schools	N	14,750	25,690	24,550	25,814	31,550	42,423	25,814	31,440	42,423
	%	100	174	166	175	214	288	100	122	164
4. Intermediate schools for the training of teachers and educational assistants	N	782	1,132	1,274	2,109	2.626	3,045	2,269	2,816	3,315
	%	100	145	163	270	336	389	100	122	146
5. General secondary schools	N	59,379	84,593	88,811	103,539	130,430	175,590	103.539	130,430	173,590
	%	100	142	150	174	220	292	100	126	168
6. Secondary technical and vocational schools	N	9,469	16,521	18,930	21,394	31,703	43,368	21,394	31.703	43.368
	%	100	174	200	226	335	458	100	148	203
7. Schools for higher social occupations	N	-	-	-	70	130	200	70	130	200
	%	-	-	-	100	186	286	100	186	286
8. Teacher training colleges, schools for vocational school teachers (1)	N	-	-	116	910	4,005	5,170	910	4,005	5.170
	%	-	-	100	784	3,453	4,457	100	440	568
9. Institutions of higher education	N	20,309	14,809	28,159	39,186	43,622	49,794	39,106	43,622	49,794
	%	100	73	139	193	215	245	100	111	127

(1) ... and courses for secondary school graduates at the expiring schools for the training of teachers.

Table 4a

First Assessment: Total enrolment of regular Austrian students at universities and equivalent institutions (a) by fields of study, (b) at the beginning of the winter term

		Index 100 = 1950/51						Index 100 = 1965/66		
		1950/51	1955/56	1960/61	1965/66	1970/71	1975/76	1965/66	1970/71	1975/76
1. Liberal arts	N	2,490	2,144	4,694	6,390	6,670	6,580	6,390	6,670	6,580
	%	100	86	189	257	268	264	100	104	103
2. Education(c)	N	100	77	192	260	270	260	260	270	260
	%	100	77	192	260	270	260	100	104	100
3. Fine arts	N	1.190	921	922	1,420	1,860	1.930	1,420	1,860	1,930
	%	100	77	77	119	156	162	100	131	136
4. Law	N	3,060	2,336	4,420	5,910	6,170	6,090	5,910	6,170	6,090
	%	100	76	144	193	202	199	100	104	103
5. Social sciences	N	3,820	2,519	4,521	6,060	6,320	6,240	6,060	6,320	6,240
	%	100	66	118	139	165	163	100	104	103
6. Natural sciences(d)	N	1,300	977	2,427	3,210	3,350	3,310	3,210	3,350	3,310
	%	100	75	187	247	258	255	100	104	103
7. Engineering	N	4,860	3,400	6.619	8,650	9,030	8,910	8,650	9,030	8,910
	%	100	70	136	178	186	183	100	104	103
8. Medical sciences	N	2,540	1,754	3,397	4,710	4,910	4,850	4,710	4,910	4.850
	%	100	69	134	185	193	191	100	104	103
9. Agriculture	N	960	681	967	1,310	1,370	1,360	1,310	1,370	1,360
	%	100	71	101	136	143	142	100	105	104
10. Total enrolment	N	20,320	14,809	28,159	37,920	39,950	39,530	37,920	39,950	39,530
	%	100	73	139	187	197	195	100	105	104

(a) Including art academies.

(b) Based on an international classification drawn up for UNESCO.

(c) Students training to become secondary school teachers are included in the groups liberal arts, fine arts, social sciences and natural sciences and cannot be listed separately.

(d) Excluding pharmacy which, according to the UNESCO classification, belongs to the medical sciences.

Table 4b

Second Assessment: Total enrolment of regular Austrian students at universities and equivalent institutions (a) by fields of study, (b) at the beginning of the winter term

		Index 100 = 1950/51						Index 100 = 1965/66		
		1950/51	1955/56	1960/61	1965/66	1970/71	1975/76	1965/66	1970/71	1975/76
1. Liberal arts	N	2,490	2,144	4,694	6,603	7,285	8,284	6,603	7,285	8,284
	%	100	86	189	265	293	333	100	110	125
2. Education(c)	N	100	77	192	270	297	323	270	297	323
	%	100	77	192	270	297	323	100	110	120
3. Fine arts	N	1,190	921	922	1,466	2,032	3,429	1,466	2,032	2,429
	%	100	77	77	123	171	204	100	139	166
4. Law	N	3,060	2,336	4,420	6,109	6,735	7,668	6,109	6,735	7,668
	%	100	76	144	200	220	251	100	110	126
5. Social sciences	N	3,820	2,519	4,521	6,262	6,901	7,852	6,262	6,901	7.852
	%	100	66	118	164	181	206	100	110	125
6. Natural sciences(d)	N	1,300	977	2,427	3,390	3,660	4,167	3,390	3,660	4,167
	%	100	75	187	261	282	321	100	108	123
7. Engineering	N	4.860	3,400	6,619	8,958	9,848	11,253	8,958	9,848	11,253
	%	100	70	136	184	203	232	100	110	126
8. Medical sciences	N	2,540	1,754	3,397	4,867	5,361	6.104	4.867	5.361	6,104
	%	100	69	134	192	211	240	100	110	125
9. Agriculture	N	960	681	967	1,352	1,493	1,714	1,352	1,493	1,714
	%	100	71	101	141	156	179	100	110	127
10. Total enrolment	N	20.320	14,809	28,159	39,186	43,622	49,794	39.186	43,622	49,794
	%	100	73	139	193	215	245	100	111	127

(a) Including art academies.

(b) Based on an international classification drawn up for UNESCO.

(c) Students training to become secondary school teachers are included in the groups liberal arts, fine arts, social sciences and natural sciences and cannot be listed separately.

(d) Excluding pharmacy which, according to the UNESCO classification, belongs to the medical sciences.

Table 5a

First Assessment: Output of the Austrian schools

		Index 100 = 1950/51						Index 100 = 1965/66		
		1950/51	1955/56	1960/61	1965/66	1970/71	1975/76	1965/66	1970/61	1975/76
1. General compulsory schools	N	73,690	97,700	91,170	23,410(a)	93,920	107,680	82,875(b)	93,920	107,680
	%	100	133	124	32	127	146	100	113	130
2. Compulsory vocational schools	N	23,200	36,730	38,910	41,180	37,170	44,300	41,180	37,871	44,300
	%	100	158	168	177	160	191	100	92	108
3. Intermediate vocational schools	N	6,490	10,310	10,058	7,000	8,460	10,340	8,865	8,460	10,340
	%	100	159	155	108	130	159	100	95	117
4. Intermediate schools for the training of teachers and educational assistants	N	374	260	529	60(c)	620	730	695(d)	620	730
	%	100	70	141	16	166	195	100	89	105
5. General secondary schools	N	3,945	3,259	7,516	7,380	2,590(e)	11,200	7,380	2,590(e)	11,200
	%	100	83	191	187	66	284	100	35	152
6. Secondary technical and vocational schools	N	1,945	1,966	3,878	3,850	3,250	4,120	3,850	3,250	4,120
	%	100	101	199	198	167	212	100	84	107
7. Schools for higher social occupations	N	-	-	-	30	50	80	30	50	80
	%	-	-	-	100	167	267	100	167	267
8. Teacher training	N	880	670	929	2,000	1,850	2,250	2,000	1,850	2,250
	%	100	76	106	227	210	256	100	93	113
9. Institutions of higher education	N	...	2,762(f)	2,799	4,709	5,339	5,146	4,709	5,339	5,146
	%	-	100	101	170	193	186	100	113	109

Table 5b

Second Assessment: Output of the Austrian schools(1)

		Index 100 = 1950/51						Index 100 = 1965/66		
		1950/51	1955/56	1960/61	1965/66	1970/71	1975/76	1965/66	1970/71	1975/76
1. General compulsory schools	N	73,090	97,700	91,170	23,410(a)	86,870	97,990	80,350(b)	86,870	97,990
	%	100	133	124	32	118	133	100	108	122
2. Compulsory vocational schools	N	23,200	36,730	38,910	41,180	37,170	44,300	41,180	37,170	44,300
	%	100	158	168	177	160	191	100	90	108
3. Intermediate vocational schools	N	6,490	10,310	10,058	7,900	9,470	12,560	7,900	9,470	12,560
	%	100	159	155	122	146	194	100	120	159
4. Intermediate schools for the training of teachers and educational assistants	N	374	260	529	70(c)	670	790	625(d)	670	790
	%	100	70	141	19	179	211	100	107	126
5. General secondary schools	N	3,945	3,259	7,516	7,490	2,980(e)	12,750	7,490	2,980	12,750
	%	100	83	191	190	76	323	100	40	170
6. Secondary technical and vocational schools	N	1,945	1,966	3,878	4,324	4,815	6,824	4,324	4,815	6,824
	%	100	101	199	222	248	351	100	111	158
7. Schools for higher social occupations	N	-	-	-	30	60	100	30	60	100
	%	-	-	-	100	200	333	100	200	333
8. Teacher training	N	880	670	929	2,130	1,975	2,530	2,130	1,975	2,530
	%	100	76	106	242	224	288	100	93	119
9. Institutions of higher education	N	...	2,762(f)	2,799	4,709	5,528	5,771	4,709	5,528	5,771
	%	-	100	101	170	200	209	100	117	123

(1) See note following Table 5a, First Assessment, for detailed breakdown of school types covered.

Breakdown of school types covered - (See Chapter I, Section A4 for description of school types)

Line 1. General compulsory schools = primary school, upper primary school, special school, polytechnic course; the extension of general compulsory schooling from 8-9 years will become effective after 1965/66. Polytechnic courses will first be conducted in 1966/67.

(a) therefore in 1965/66 only those pupils will leave school who have voluntarily completed a ninth school year at primary school, upper primary school or special school.

(b) for the calculation of the 1965/1975 index the base figure 100 therefore represents the arithmetic mean of 1964/65 and 1966/67.

Line 2. Compulsory vocational schools = trade vocational school, commercial vocational school, vocational school for women's domestic and catering occupations.

Line 3. Intermediate vocational schools = trade, technical and arts-and-crafts schools, commercial school, intermediate vocational school for women's domestic and catering occupations, intermediate vocational school for social workers.

Line 4. Intermediate schools for the training of teachers and educational assistants = school for the training of women handicraft teachers, school for kindergarten teachers, school for educational assistants, school for teachers of domestic science and vocational subjects.

(c) the legal provisions hitherto applicable with respect to the schools for kindergarten teachers and women handicraft teachers expire in 1964/65; the new schools for kindergarten teachers and women handicraft teachers will hold their first qualifying examinations in 1966/67.

(d) for the calculation of the 1965/75 index the base figure 100 for this reason represents the arithmetic mean of 1966/65 and 1966/67.

Line 5. General secondary schools = arts grammar school, science grammar school, domestic science college for girls, grammar school mainly for future teachers, rural science grammar school, rural arts grammar school, science grammar school and arts grammar school for employed persons, secondary boarding school, secondary boarding schools operated as craft-school boarding establishments, expire:

the (8-year) arts grammar schools	1969/70	(9-year) arts grammar school and science grammar school (first output: 1971/72)
the (8-year) science grammar schools	1969/70	
the (8-year) science grammar schools without Latin	1969/70	
the (8-year) domestic science colleges for girls	1969/70	(9-year) domestic science colleges for girls (first output: 1971/72)
the (4-year) grammar schools for employed persons	1969/70	arts grammar school and science grammar school for employed persons (comprises 10 half-year courses)
the (5-year) rural grammar schools	1969/70	rural arts grammar school and rural science grammar school (one-year transition course, [illegible]-year upper division)

(e) under the 1962 School Organisation Act the four-year upper division of general secondary school is extended to comprise five years. In 1969/70 the 8-year general secondary schools will conduct their last final classes; at the 9-year general secondary schools the first leaving examinations will take place in 1971/72; the five-to-six-year special types will conduct their first final classes in 1967/68.

Line 6. Secondary vocational schools = secondary technical and trade training establishments, business academies, secondary training establishments for women's domestic and catering occupations.

Line 7. The schools for higher social occupations had their first leaving examinations in 1964/65

Line 8. School for the training of teachers, etc.

	expire:	
secondary schools for the training of teachers	1966/67	teacher training colleges (first output: 1969/70)
1-year course for secondary school graduates at schools for the training of teachers	1965/66	
2-year course for secondary school graduates at schools for the training of teachers	1968/69	teacher training colleges (first output: 1969/70)
schools for teachers of domestic science and vocational subjects	1963/64	schools for vocational school teachers (first output: 1964/65)

Line 9. Universities, colleges and arts academies

(f) no output figures are available for 1950/51. For this reason the 1955/56 output was used as the base figure for the calculation of the index.

Table 6a

First Assessment: Output of the general compulsory schools by type

		Index 100 = 1950/51						Index 100 = 1965/66		
		1950/51	1955/56	1960/61	1965/66(a)	1970/71	1975/76	1965/66(b)	1970/71	1975/76
Primary school Total	N	42,020	38,990	[illegible],730	3,110	19,310	22,030	25,625	19,310	22,030
	%	100	[illegible]	80	7	46	52	100	75	86
Of these from the	N	11,980	18,6[illegible]	[illegible],710	2,330	10,710	12,150	13,735	10,710	12,150
8th school grade. .	%	100	1[illegible]	148	19	89	101	100	78	88
Upper primary school Total	N	30,440	56,100	53,960	19,580	32,230	36,770	36,940	32,230	36,770
	%	100	184	177	64	106	121	100	87	100
Of these from the	N	21,030	47,010	44,720	19,300	29,560	35,080	31,880	29,560	35,080
4th class	%	100	224	213	92	141	167	100	93	110
Special school Total	N	1,230	2,610	3,480	720	3,030	3,500	2,985	3,030	3,500
	%	100	212	283	59	246	285	100	102	117
Of these from the	N	110	550	760	220	1,110	1,280	865	1,110	1,280
8th school grade. .	%	100	300	691	200	1,009	1,164	100	128	148
Polytechnic course	N	-	-	-	-	39,350(c)	43,990	-	39,350(d)	43,990
	%	-	-	-	-	100	112	-	100	112
Output (total 1+3+5+7)	N	73,690	97,700	91,170	23,410	93,920	107,680	82,875	93,920	107,680
	%	100	133	124	32	127	146	100	113	130

(a) The anticipated extension of general compulsory schooling from 8 to 9 years, under the 1962 School Organisation Act, is making itself felt in this projection.

(b) For the calculation of the 1965/75 index the base figure 100 therefore represents the arithmetic mean of 1964/65 and 1966/67.

(c) The polytechnic course will first be conducted in 1966/67.

(d) For the calculation of the index the base figure 100 was taken to represent 1970/71.

Table 6b

Second Assessment

Output of the general compulsory schools

In this assessment we estimated the enrolment in the polytechnic courses by subtracting from the total enrolment of the relevant age group the enrolment figures for the intermediate and secondary schools, including schools of agriculture and forestry, as well as the number of pupils who remain in primary, upper primary or special schools for a ninth school year.

The estimated increase in the flow to intermediate and secondary schools tends to decrease the percentage of pupils who are expected to attend the polytechnic course. Nevertheless, the absolute numbers are on the rise as a consequence of various demographic factors.

The resulting estimate is as follows:

1966/67	41,450	
1967/68	37,600	
1968/69	37,670	
1969/70	38,620	
1970/71	40,700	Pupils in the polytechnic courses
1971/72	41,900	
1972/73	41,920	
1973/74	42,600	
1974/75	42,900	
1975/76	43,900	

Other figures for the compulsory school level do not substantially change in the Second Assessment projection, and therefore a full table is not presented here.

Table 7a

First Assessment: Output of the compulsory vocational schools(a) by branches of the economy

Number of journeymen's examinations passed

		Index 100 = 1960/61				Index 100 = 1965/66		
		1960/61	1965/66	1970/71	1975/76	1965/66	1970/71	1975/76
1. Trade and industry	N	28.860	30,810	27,770	33,090	30,810	27,770	33,090
	%	100	107	96	115	100	90	107
2. Commerce	N	7,860	8,340	7,520	8,950	8,340	7,520	8,950
	%	100	106	96	114	100	90	107
3. Transportation	N	170	200	180	220	200	180	220
	%	100	118	106	129	100	90	110
4. Tourist industry	N	1,080	1,140	1,020	1,220	1,140	1,020	1,220
	%	100	106	94	113	100	89	107
5. Total	N	37,970	40,490	36,490	43.480	40,490	36,490	43,486
	%	100	107	96	115	100	90	107

(a) Output of commercial and trade schools only. The output of the vocational school for women's domestic and catering occupations are not included here, since a comparison of the output of the commercial and trade schools and the number of journeymen's examinations passed in the same year has shown that the figures are almost identical. These examinations were used in this table as the basis for the calculation of the output of the vocational schools.

Table 7b

Second Assessment: Output of the compulsory vocational schools(a) by branches of the economy

Number of journeymen's examinations pas[illegible]

		Index 100 = 1960/[illegible]				Index 100 = 1965/66		
		1960/61	1965/66	1970/71	1975/76	1965/66	1970/71	1975/76
1. Trade and industry	N	28,860	30,810	27,770	33,090	30,810	27,770	33,090
	%	100	107	96	115	100	90	107
21 Commerce	N	7,860	8,340	7,520	8,950	8,340	7,520	8.950
	%	100	106	96	114	100	90	107
3. Transportation	N	170	200	180	220	200	180	220
	%	100	118	106	129	100	90	110
4. Tourist industry	N	1,080	1.140	1,020	1,220	1,140	1,020	1,220
	%	100	106	94	113	100	89	107
5. Total	N	37,970	40,490	36,490	43,480	40,490	36,490	43,480
	%	100	107	96	115	100	90	107

(a) Output of the commercial and trade schools only. The output of the vocational school for women's domestic, and catering occupations is not included here, since a comparison of the output of the commercial and trade schools and the number of journeymen's examinations passed in the same year has shown that the figures are almost identical. These examinations were used in this table as the basis for the calculation of the output of the vocational schools.

Table 8a

First Assessment: Output of the intermediate vocational schools

		Index 100 = 1950/51						Index 100 = 1965/66		
		1950/51	1955/56	1960/61	1965/66	1970/71	1975/76	1965/66	1970/71	1975/76
1. Trade, technical and arts-and-crafts schools	N	2,260	3,000	3,270	1,240(a)	2,690	3,110	2,105(b)	2,690	3,110
	%	100	133	145	55	119	138	100	128	148
2. Commercial schools	N	1,700	4,190	4,128	3,040	2,870	3,550	3,040	2,870	3,550
	%	100	246	243	179	169	209	100	94	117
3. Intermediate vocational schools for women's domestic and catering occupations	N	2,460	3,070	2,580	2,670	2,850	3,610	2,670	2,850	3,610
	%	100	125	105	109	116	147	100	107	135
4. Intermediate vocational schools for social workers	N	70	50	80	50	50	70	50	50	70
	%	100	71	114	71	71	100	100	100	140
5. Total	N	6,490	10,310	10,058	7,000	8,460	10,340	8,865	8,460	10,340
	%	100	159	155	100	130	159	100	95	117

Line 1. Including schools for construction workers, schools and classes for master craftsmen, schools for foremen.

Line 2. The commercial schools, which formerly comprised 2 years, were discontinued in 1963/64 and have been extended to comprise 3 years (first output: 1965/66).

(a) The two-year vocational schools were discontinued in 1963/64 and have been extended to comprise 3 years (first output: 1965/66).

(b) The three-year vocational schools were discontinued in 1964/65 and have been extended to comprise 4 years (first output: 1966/67).

Table 8b

Second Assessment: Output of the intermediate vocational schools

		Index 100 = 1950/51						Index 100 = 1965/66		
		1950/51	1955/56	1960/61	1965/66	1970/71	1975/76	1965/66	1970/71	1975/76
1. Trade, technical and arts-and-crafts schools	N	2,260	3,000	3,270	1,320(a)	2,950	3.730	2,860(b)	2,950	3,730
	%	100	133	145	58	131	165	100	103	130
2. Commercial schools	N	1,700	4,190	4,128	3,810	3,510	4,970	3,810	3,510	4.970
	%	100	246	243	224	206	292	100	92	130
3. Intermediate vocational schools for women's domestic and catering occupations	N	2,460	3,070	2,580	2,710	2,940	3,760	2,710	2.940	3,760
	%	100	125	105	110	120	153	100	108	139
4. Intermediate vocational schools for social workers	N	70	50	80	60	70	100	60	70	100
	%	100	71	114	86	100	143	100	117	167
5. Total	N	6,490	10,310	10,058	7,900	9,470	12,560	7,900	9,470	12,560
	%	100	159	155	121	146	194	100	120	159

Line 1. Including schools for construction workers, school and classes for master craftsmen, schools for foremen.

Line 2. The commercial schools, which formerly comprised 2 years, expired in 1963/64 and have been extended to comprise 3 years (first output: 1965/66).

(a) The two-year vocational schools expired in 1963/64 and have been extended to comprise 3 years (first output: 1965/66).

(b) The three-year vocational schools expired in 1964/65 and have been extended to comprise 4 years (first output: 1966/67).

Table 9a

First Assessment: Output of the intermediate schools for the training of teachers and educational assistants

		Index 100 = 1950/51						Index 100 = 1965/66		
		1950/51	1955/56	1960/61	1965/66	1970/71	1975/76	1965/66	1970/71	1975/76
1. Schools for the training of women handicraft teachers	N	128	17	105	-(a)	210	250	205(b)	210	250
	%	100	13	82		164	195	100	102	122
2. Schools for the training of kindergarten teachers	N	206	188	344	-(c)	350	410	430(d)	35	410
	%	100	91	167		170	19	100	81	95
3. Schools for educational assistants	N	-	-	10(e)	60	60	70	60	60	70
	%			100	600	600	700	100	100	117
4. Total (= sum 1+2+3)	N	334	205	459	60	620	730	695	620	730
	%	100	61	137	18	186	219	100	89	105

(a) The 3-year schools for women handicraft teachers expire in 1964/65; first output of the new 4-year schools for women handicraft teachers: 1966/67.
(b) For this reason the arithmetic mean of 1964/65 and 1966/67 was used as the base figure for the calculation of the 1965/75 index.
(c) The 3-year schools for kindergarten teachers expire in 1964/65; first output of the new 4-year schools for kindergarten teachers: 1966/67.
(d) See (b).
(e) First output 1960/61; therefore the index was calculated on the basis of that school year.

Table 9b

Second Assessment: Output of the intermediate schools for the training of teachers and educational assistants

		Index 100 = 1950/51						Index 100 = 1965/66		
		1950/51	1955/56	1960/61	1965/66	1970/71	1975/76	1965/66	1970/71	1975/76
1. Schools for the training of women handicraft teachers	N	128	17	105	-(a)	230	270	205(b)	230	270
	%	100	13	82		180	211	100	112	132
2. Schools for the training of kindergarten teachers	N	206	188	344	-(c)	360	420	355(d)	360	420
	%	100	91	167		175	204	100	101	118
3. Schools for educational assistants	N	-	-	10(e)	70	80	100	70	80	100
	%			100	700	800	1,000	100	114	143
4. Total (= sum 1+2+3)	N	334	205	459	70	670	790	630	670	790
	%	100	61	137	21	201	237	100	106	125

(a) The 3-year schools for women handicraft teachers expire in 1964/65; first output of the new 4-year schools for women handicraft teachers: 1966/67.
(b) For this reason the arithmetic mean of 1964/65 and 1966/67 was used as the base figure for the calculation of the 1965/75 index.
(c) The 3-year schools for kindergarten teachers expired in 1964/65; first output of the new 4-year schools for kindergarten teachers: 1966/67.
(d) See (b).
(5) First output 1960/61; therefore the index was calculated on the basis of that school year.

Table 10a

First Assessment: Output of the secondary schools

		Index 100 = 1950/51						Index 100 = 1965/66		
		1950/51	1955/56	1960/61	1965/66	1970/71	1975/76	1965/66	1970/71	1975/76
1. Secondary technical and trade training establishments	N %	930 100	773 33	1,629 175	1,720 185	1,620 174	1,960 211	1,720 100	1,620 94	1,960 114
2. Business academies	N %	488 100	741 152	1,538 315	1,390 285	990 203	1,400 287	1,390 100	990 71	1,400 101
3. Courses for secondary school graduates at business academies	N %	430 100	270 63	400 93	350 81	360 84	420 98	350 100	360 103	420 120
4. Secondary training establishments for women's domestic and catering occupations	N %	97 100	182 188	311 321	390 402	280 289	340 351	390 100	280 72	340 87
5. Secondary vocational schools (= total 1+2+3+4)	N	1,945 100	1,966 101	3,878 199	3,850 198	3,250 167	4,120 212	3,850 100	3,250 84	4,120 107
6. General secondary schools	N %	3,945 100	3,259 83	7,516 191	7,380 187	2,590 66	11,200 284	7,380 100	2.590 35	11,200 152
7. Secondary schools (= total 1+2+3+4+6)	N %	5.460 100	4,955 91	10,994 201	10,880 199	5,480 100	14,900 273	10,880 100	5,480 50	14,900 137

Table 10b

Second Assessment: Output of the secondary schools

		Index 100 = 1950/51						Index 100 = 1965/66		
		1950/51	1955/56	1960/61	1965/66	1970/71	1975/76	1965/66	1970/71	1975/76
1. Secondary technical and trade training establishments	N %	930 100	773 83	1,531 165	1,750 188	2,210 238	3.170 341	1,750 100	2.210 126	3,170 181
2. 1-2 year courses for secondary school graduates at secondary technical and trade training establishments	N %	- -	- -	- -	180 100	290 160	370 204	180 100	290 161	370 206
3. Secondary technical and trade training establishments for employed persons	N %	- -	- -	98 100	160 163	190 194	330 337	160 100	190 119	330 206
4. Business academies	N %	488 100	741 152	1,538 315	1,603 328	1,400 287	2,040 418	1,603 100	1,400 87	2,040 127
5. Courses for secondary school graduates at business academies	N %	430 100	270 63	400 .93	330 77	340 79	400 93	330 100	340 103	400 121
6. Business academies for employed persons	N %	- -	- -	- -	- -	15 100	34 227	- -	15 100	34 227
7. Secondary training establishments for women's domestic and catering occupations	N %	97 100	182 188	311 321	300 309	370 381	480 495	300 100	370 123	480 227
8. Secondary vocational schools	N %	1,945 100	1,966 101	3,878 199	4,324 222	4,815 248	6,824 351	4,324 100	4,815 111	6,824 158
9. General secondary schools	N %	3,945 100	3,259 83	7,516 191	7,490 190	2,980 76	12,750 323	7,490 100	2,980 40	12,750 170
10. Institutions of higher education (= total, 1,3,4,6, 7 and 9)	N %	5,460 100	4,955 91	10,994 201	11,303 207	7,165 131	18,804 344	11,303 100	7,165 63	18,804 166

Table 11a

First Assessment: Output of the academies and related institutions

		Index 100 = 1950/51						Index 100 = 1965/66		
		1950/51	1955/56	1960/61	1965/66	1970/71	1975/76	1965/66	1970/71	1975/76
1. Old type secondary schools for the training of teachers (a)	N %	800 100	670 76	782 89	1,330 151	-	-	1,330 100	-	-
2. One-and two-year courses for secondary school graduates at secondary schools for the training of teachers (a)	N %	-	-	147 100	670 456	-	-	670 100	-	-
3. New type teacher training colleges(a)	N %	-	-	-	-	1,730 100	2,120 123	-	1,730 100	2,120 123
4. Total 1+2+3	N %	880 100	670 76	929 106	2,000 227	1,730 197	2,120 241	2,000 100	1,730 87	2,120 106
5. Schools for vocational teachers of domestic science and trade subjects (a)	N %	40 100	55 138	70 175	-	-	-	- 100	-	-
6. Schools for vocational school teachers(a)	N %	-	-	-	70 100	120 171	130 186	70 100	120 171	130 186
7. Total 5+6	N %	40 100	55 138	70 175	70 175	120 300	130 325	70 100	120 171	130 186
8. Schools for higher social occupations	N %	-	-	-	30 100	50 167	80 267	30 100	50 167	80 267

(a) See Chapter I, Section A4, on reforms in the organisation and structure of teacher training.

Table 11b

Second Assessment: Output of the academies and related institutions

		Index 100 = 1950/51						Index 100 = 1965/66		
		1950/51	1955/56	1960/61	1965/66	1970/71	1975/76	1965/66	1970/71	1975/76
1. Old type secondary schools for the training of teachers (a)	N %	880 100	670 76	782 89	1,390 158	-	-	1,390 100	-	-
2. One-and two-year courses for secondary school graduates at secondary school for the training of teachers (a)	N %	-	-	147 100	680 463	-	-	680 100	-	-
3. New type teacher training colleges(a)	N %	-	-	-	-	1,880 100	2,400 128		1,880 100	2,400 128
4. Total 1+2+3	N %	88[illegible] 10[illegible]	670 76	929 106	2,070 235	1,880 214	2,400 273	2,070 100	1,880 91	2,400 116
5. Schools for vocational teachers of domestic science and trade subjects (a)	N %	40 100	55 138	70 175	-	-	-	-	-	-
6. Schools for vocational school teachers (a)	N %	-	-	-	60 100	95 158	130 217	60 100	95 158	130 217
7. Total 5+6	N %	40 100	55 138	70 175	60 150	95 238	130 325	60 100	95 158	130 217
8. Schools for higher social occupations	N %	-	-	-	30 100	60 200	100 333	30 100	60 200	100 333

(a) See Chapter I, Section A4, on reforms in the organisation and structure of teacher training.

Table 12a

First Assessment: Output of the institutions of higher education(a) - by main fields of study(b)

		Index 100 = 1955/56					Index 100 = 1965/66		
		1955/56	1960/61	1965/66	1970/71	1975/76	1965/66	1970/71	1975/76
1. Liberal arts	N	244	223	427	472	448	427	472	448
	%	100	91	175	193	184	100	111	105
2. Education	N	175	185	340	373	353	340	373	353
	%	100	106	194	213	202	100	110	104
3. Fine arts	N	205	238	256	308	359	156	308	359
	%	100	116	125	150	175	100	197	230
4. Law	N	651	737	1,323	1,484	1,428	1,323	1,484	1,428
	%	100	113	203	228	219	100	112	108
5. Social sciences	N	310	462	803	887	843	803	887	843
	%	100	149	259	286	272	100	110	105
6. Natural sciences	N	98	74	186	185	174	186	185	174
	%	100	76	190	189	178	100	99	94
7. Engineering	N	457	486	775	782	762	775	782	762
	%	100	106	170	171	167	100	101	98
8. Medical sciences	N	417	245	461	565	581	461	565	581
(c)	%	100	59	111	135	139	100	123	126
9. Agriculture	N	205	149	256	283	261	256	283	261
	%	100	73	125	138	127	100	111	102
10. Total	N	2,762	2,799	4,700	5,339	5,146	4,709	5,339	5,146
	%	100	101	170	193	186	100	113	109

(a) Universities, colleges and arts academies.
(b) Based on an international UNESCO classification.
Students training to become secondary school teachers are included in columns 1,3,5 and 6 and cannot be listed separately.
(c) Including pharmacy.

Table 12b

Second Assessment: Output of the institutions of higher education(a) - by main fields of study(b)

		Index 100 = 1955/56					Index 100 = 1965/66		
		1955/56	1960/61	1965/66	1970/71	1975/76	1965/66	1970/71	1975/76
1. Liberal arts	N	244	223	427	479	490	427	479	490
	%	100	91	175	196	201	100	112	115
2. Education	N	175	185	340	384	391	340	384	391
	%	100	106	194	219	223	100	113	115
3. Fine arts	N	205	238	256	401	435	256	401	435
	%	100	116	125	196	212	100	157	170
4. Law	N	651	737	1,323	1,521	1,568	1,323	1,521	1,568
	%	100	113	203	234	241	100	115	119
5. Social sciences	N	310	462	803	905	986	803	905	986
	%	100	149	259	292	318	100	113	123
6. Natural sciences	N	98	74	186	190	212	186	190	212
	%	100	76	190	194	216	100	102	114
7. Engineering	N	457	486	775	785	793	775	785	793
	%	100	106	170	172	174	100	101	102
8. Medical sciences	N	417	245	461	573	603	461	573	603
(c)	%	100	59	111	137	145	100	124	131
9. Agriculture	N	205	149	256	290	293	256	290	293
	%	100	73	125	141	143	100	113	114
10. Total	N	2,762	2,799	4,709	5,528	5,771	4,709	5,528	5,771
	%	100	101	170	200	209	100	117	123

(a) Universities, colleges and arts academies.
(b) Based on an international UNESCO classification.
Students training to become secondary school teachers are included in columns 1,3,5 and 6 and cannot be listed separately.
(c) Including pharmacy.

Note: The relatively small differences in the projected figures for the First and Second Assessments obviated the need to estimate second degrees for 1970/71 and 1975/76 for the Second Assessment (Table 12c).

Table 12c

First Assessment: Of the graduates listed in table 12a the following numbers received a second degree:

		Index 100 = 1955/56					Index 100 = 1965/66		
		1955/56	1960/61	1965/66	1970/71	1975/76	1965/66	1970/71	1975/76
1. Liberal arts	N	66	56	130	147	146	130	147	146
	%	100	85	197	223	221	100	113	112
2. Education	N	-	-	-	-	-	-	-	-
	%								
3. Fine arts	N	8	6	14	16	16	14	16	16
	%	-	-	-	-	-	-	-	-
4. Law	N	341	304	590	666	657	590	666	657
	%	100	89	173	195	193	100	113	111
5. Social sciences	N	54	81	150	170	168	150	170	168
	%	100	150	278	315	311	100	113	112
6. Natural sciences	N	14	15	37	42	42	37	42	42
	%	-	-	-	-	-	100	-	-
7. Engineering	N	41	55	83	93	92	83	93	92
	%	-	-	-	-	-	100	-	-
8. Medical sciences	N	6	6	8	10	9	8	10	9
	%	-	-	-	-	-	100	-	-
9. Agriculture	N	45	34	68	76	66	68	76	66
	%	-	-	-	-	-	100	-	-
10. Total	N	575	557	1,080	1,220	1,196	1,080	1,220	1,196
	%	100	97	188	212	208	100	113	111

This table includes all graduates who have already completed their studies at a university, or equivalent institution, and are now taking a second degree. These would include people with diplomas in interpreting, doctor's degrees in law, all those who before taking a doctor's degree pass the qualifying examination for secondary school teachers.

Notes to First and Second Assessments - Tables 13-24b

These tables show the number of pupils and students in each of the relevant age groups attending the various types of schools. The data, which include both absolute numbers (compared to the total population of each age group) and following participation ratios expressed as percentages, are presented for the school years:

1950/51	Tables 12, 13
1955/56	Tables 14, 15
1960/61	Tables 16, 17
1965/66	Tables 18, 19
1970/71	Tables 20, 21
1975/76	Tables 22, 23

For the years 1950/51 to 1960/61 inclusive, the data constitute definitive figures for past years. Starting with 1965/66, projections according to both the First and Second Assessments are given.

The tables should be read as follows: e.g., on 1st September, 1950, there were 89,500 children aged 5; of these 29,200 (= 32.6 per cent) attended a general compulsory school (tables 13 and 14).

It should be recalled that the grammar school mainly for future teachers is a special type of general secondary school introduced by the 1962 School Organisation Act (see Chapter I, Section A4).

First-year classes were conducted for the first time in 1963/64, and final-year classes will start in 1967/68.

The old-type secondary schools for the training of teachers held first-year classes for the last time in 1962/63 and will have their last final classes in 1966/67.

During the transitional period (1962-1967) the newly introduced grammar schools mainly for future teachers and the expiring secondary teacher training schools are, as a rule, accommodated in the same buildings. For this reason, in the tables below the pupils of the secondary schools for teacher training are included in the enrolments of the general secondary schools (See Chapter I, Section A4, for explanation of reforms in teacher training).

Table 13: First and Second Assessment

Enrolment in 1950/51 in schools and Institutions of Higher Education

(a) As a percentage of the population of the corresponding age group (and type of school)

Age (completed years)	General compulsory schools	Compulsory vocational schools	Intermediate vocational schools	Intermediate schools for the training of teachers and educational assistants	General secondary schools	Secondary vocational schools	Schools for higher social occupations	Teacher training colleges and schools for vocational school teachers	Institutions of higher education including arts academies	Total enrolment	Population
5	32.6									32.6	100 %
6	97.6									97.6	100 %
7	99.4									99.4	100 %
8	99.7									99.7	100 %
9	96.9				2.8					99.7	100 %
10	91.5				8.3					99.8	100 %
11	90.9				8.9					99.8	100 %
12	90.0				9.7					99.7	100 %
13	68.15	0.72	0.34	0.04	8.46	0.10				77.80	100 %
14	17.12	23.16	4.15	0.16	5.87	1.37				51.85	100 %
15	1.55	25.41	4.41	0.20	5.24	1.90				38.70	100 %
16	0.33	23.90	3.26	0.18	4.39	2.19				34.26	100 %
17		12.89	1.69	0.09	3.54	1.87			0.22	20.30	100 %
18		6.70	0.80	0.06	1.00	1.44			1.47	11.46	100 %
19		3.86	0.51	0.06	0.27	0.79			2.15	7.64	100 %
20		1.75	0.43	0.04	0.14	0.45			2.72	5.52	100 %
21		0.62	0.42	0.03	0.13	0.21			3.03	4.44	100 %
22		0.12	0.39	0.02	0.12	0.15			2.83	3.62	100 %
23			0.23	0.01	0.10	0.08			2.30	2.73	100 %
24			0.13		0.09	0.04			1.43	1.69	100 %
25			0.06		0.06	0.02			0.89	1.03	100 %
26			0.03		0.05	0.01			0.65	0.73	100 %

Table 14: First and Second Assessment

(b) By age group and type of school in absolute numbers

Age (completed years)	General compulsory schools	Compulsory vocational schools	Intermediate vocational schools	Intermediate schools for the training of teachers and educational assistants	General secondary schools	Secondary vocational schools	Schools for higher social occupations	Teacher training colleges and schools for vocational school teachers	Institutions of higher education including arts academies	Total enrolment	Population
5	29,200									29,200	89,500
6	104,500									104,500	107,100
7	107,900									107,900	108,500
8	114,300									114,300	114,700
9	126,400				3,700					130,100	130,400
10	124,100				11,200					135,300	135,600
11	107,800				10,500					118,300	118,600
12	79,700				8,600					88,300	88,600
13	56,700	595	279	36	7,036	95				64,731	85,200
14	14,400	19,481	3,490	138	4,940	1,155				43,604	84,100
15	1,310	21,524	3,736	165	4,440	1,606				32,781	84,700
16	290	20,794	2,838	153	3,818	1,909				29,802	87,000
17		11,616	1,526	83	3,193	1,681			194	18,293	90,100
18		6,228	743	58	930	1,339			1,363	10,661	93,000
19		3,692	488	54	262	753			2,056	7,305	95,600
20		1,717	422	36	135	444			2,665	5,419	98,100
21		606	405	26	129	204			2,939	4,309	97,100
22		118	376	21	117	142			2,759	3,533	97,600
23			225	12	97	79			2,225	2,638	96,700
24			133		90	41			1,417	1,681	99,400
25			57		63	19			913	1,052	102,100
26			29		51	8			665	753	102,700
27 and older			3		78	4			3,113	3,198	
	866,600	86,371	14,750	782	59.379	9.469			20,309	1,057,660	

Table 15: First and Second Assessment

Enrolment in 1955/56 in Schools and Institutions of Higher Education

(a) As a percentage of the population of the corresponding age group (and type of school)

Age (completed years)	General compulsory schools	Compulsory vocational schools	Intermediate vocational schools	Intermediate schools for the training of teachers and educational assistants	General secondary schools	Secondary vocational schools	Schools for higher social occupations	Teacher training colleges and schools for vocational school teachers	Institutions of higher education including arts academies	Total enrolment	Population
5	7.7									7.7	100 %
6	97.7									97.7	100 %
7	99.5									99.5	100 %
8	99.5									99.5	100 %
9	95.0				4.7					99.7	100 %
10	86.1				13.6					99.7	100 %
11	85.3				14.4					99.7	100 %
12	85.8				13.9					99.7	100 %
13	63.47	1.02	0.40		9.73	0.14				74.75	100 %
14	14.45	27.66	5.81	0.05	7.23	2.29				57.49	100 %
15	1.46	32.38	6.11	0.20	5.57	2.82				47.8	100 %
16	0.26	30.50	4.22	0.23	4.59	3.21				43.02	100 %
17		18.31	2.04	0.21	2.91	2.93			0.27	26.68	100 %
18		9.51	0.91	0.13	1.08	2.01			1.82	15.46	100 %
19		5.49	0.69	0.11	0.27	1.00			2.11	9.54	100 %
20		2.48	0.46	0.07	0.15	0,53			2.21	5.90	100 %
21		0.89	0.47	0.04	0.16	0.23			2.07	3.86	100 %
22		0.17	0.43	0.03	0.18	0.14			1.85	2.79	100 %
23			0.27	0.02	0.15	0.08			1.51	2.02	100 %
24			0.16	0.01	0.14	0.04			1.12	1.47	100 %
25			0.06		0.10	0.01			0.82	0.99	100 %
26			0.03		0.08	0.01			0.57	0.69	100 %

Table 16: First and Second Assessment

(b) By age group and type of school in absolute numbers

5	7,660									7,600	98,200
6	103,500									103,500	106,000
7	108,000									108,000	108,500
8	105,400									105,400	105,900
9	86,200				4,300					90,500	90,800
10	76,800				12,100					88,900	89,200
11	91,200				15,400					106,600	107,000
12	92,600				15,000					107,600	107,900
13	72,033	1,152	456		11,039	157				84,837	113,500
14	18,622	35,652	7,492	68	9,324	2,948				74,106	128,900
15	1,958	43,485	8,211	271	7,482	3,790				65,197	134,300
16	308	35,658	4,935	271	5,365	3,754				50,291	116,900
17		15,871	1,769	183	2,526	2,544			236	23,129	86,700
18		7,722	740	107	877	1,629			1,476	12,551	81,200
19		4,481	460	92	219	819			1,721	7,792	81,700
20		2,042	378	55	125	435			1,818	4,853	82,300
21		745	394	36	136	195			1,740	3,246	84,000
22		150	375	23	146	125			1,617	2,436	87,400
23			241	16	136	73			1,358	1,824	90,200
24			150	10	131	34			1,039	1,364	93,100
25			58		97	13			732	950	95,700
26			27		76	5			543	651	95,000
27 and older			4		114				2,479	2,597	
	764,221	146,958	25,690	1,132	84,593	16,521			14,809	1,053,924	

Table 17: First and Second Assessment

Enrolment in 1960/61 in Schools and Institutions of Higher Education

(a) As a percentage of the population of the corresponding age group (and type of school)

Age (completed years)	General compulsory schools	Compulsory vocational schools	Intermediate vocational schools	Intermediate schools for the training of teachers and educational assistants	General secondary schools	Secondary vocational schools	Schools for higher social occupations	Teacher training colleges and schools for vocational school teachers	Institutions of higher education including arts academies	Total enrolment	Population
5	3.8									3.8	100 %
6	96.8									96.8	100 %
7	99.3									99.3	100 %
8	99.5									99.5	100 %
9	98.6				1.1					99.7	100 %
10	89.5				10.3					99.8	100 %
11	86.8				12.8					99.7	100 %
12	87.4				12.4					99.8	100 %
13	73.96	1.70	0.44		11.97	0.16				88.23	100 %
14	14.19	33.56	6.19	0.07	10.12	2.64				67.40	100 %
15	1.30	35.28	7.48	0.16	8.97	3.55				56.73	100 %
16	0.19	31.67	4.98	0.31	8.69	3.66				49.51	100 %
17		19.59	21.24	0.29	7.25	3.43		0 002	0.55	33.35	100 %
18		7.66	0.91	0.17	1.60	2.29			3.55	16.18	100 %
19		3.65	0.50	0.08	0.56	1.13		0.04	4.09	10.05	100 %
20		1.27	0.43	0.04	0.20	0.60		0.03	3.94	6.50	100 %
21		0.17	0.44	0.03	0.29	0.27		0.01	3.41	4.62	100 %
22		0.05	0.42	0.02	0.31	0.22		0.01	2.70	3.74	100 %
23			0.27	0.02	0.29	0.16		0.01	2.09	2.83	100 %
24			0.16	0.01	0.27	0.10			1.40	1.93	100 %
25			0.06		0.19	0.06			0.99	1.30	100 %
26			0.03		0.15	0.04			0.66	0.88	100 %

Table 18: First and Second Assessment

(b) By age group and type of school in absolute numbers

5	3,900									3,900	100,800
6	94,300									94,300	97,400
7	94,900									94,900	95,600
8	94,000									94,000	94,500
9	93,500				1,000					94,500	94,800
10	87,400				10,100					97,500	97,700
11	89,500				13,200					102,700	103,000
12	94,300				13,300					107,600	107,900
13	78,175	1,800	465		12,656	165				93,261	105,700
14	12,873	30,435	6,184	64	9,180	2,396				61,132	90,700
15	1,157	31,400	6,654	142	7,982	3,157				50,492	89,000
16	203	33,860	5,323	335	9,290	3,912				52,923	106,900
17		21,037	2,402	311	7,789	3,685		2	591	35,817	107,400
18		8,636	1,029	190	1,806	2,575			3,997	18,233	112,700
19		4,664	643	97	720	1,440		48	5,232	12,844	127,800
20		1,682	575	58	266	796		35	5,321	8,643	132,900
21		200	505	34	335	310		15	3,942	5,341	115,500
22		41	359	19	264	190		10	2,299	3,182	85,100
23			211	16	225	128		6	1,651	2,237	79,000
24			124	8	209	80			1,102	1,523	78,800
25			48		151	50			774	1,023	78,600
26			25		122	33			527	707	80,500
27 and older			3		216	13			2,813	3,045	
	744,208	133,755	24,550	1,274	88,811	18,930		116	28,159	1,039,803	

Table 19a: First Assessment

Enrolment in 1965/66 in Schools and Institutions of Higher Education

(a) As a percentage of the population of the corresponding age group (and type of school)

Age (completed years)	General compulsory schools	Compulsory vocational schools	Intermediate vocational schools	Intermediate schools for the training of teachers and educational assistants	General secondary schools	Secondary vocational schools	Schools for higher social occupations	Teacher training colleges and schools for vocational school teachers	Institutions of higher education including arts academies	Total enrolment	Population
5	5.0									5.0	100 %
6	96.7									96.7	100 %
7	99.4									99.4	100 %
8	99.6									99.6	100 %
9	98.8				0.8					99.6	100 %
10	88.1				11.6					99.7	100 %
11	85.9				13.8					99.7	100 %
12	86.7				13.1					99.8	100 %
13	79.16	2.56	0.19	0.02	13.17	0.09				95.17	100 %
14	11.96	35.45	5.75	0.39	11.41	2.42				67.37	100 %
15	2.13	36.00	6.73	0.44	10.35	3.35				58.99	100 %
16	0.17	33.66	6.28	0.50	9.73	2.76				53.10	100 %
17		20.70	2.66	0.43	8.31	3.48	0.05	0.06	0.20	35.80	100 %
18		6.53	1.07	0.18	2.85	2.61	0.01	0.23	3.56	17.04	100 %
19		3.07	0.66	0.08	0.84	1.21	0.02	0.25	5.05	11.17	100 %
20		1.05	0.68	0.04	0.41	0.63	0.02	0.18	5.14	8.16	100 %
21		0.03	0.42	0.01	0.29	0.33	0.01	0.12	5.15	6.37	100 %
22			0.29	0.01	2.23	0.24	0.01	0.07	4.90	5.74	100 %
23			0.18	0.01	0.21	0.18	0.003	0.05	4.04	4.65	100 %
24			0.10	0.01	0.17	0.10	0.002	0.03	2.79	3.20	100 %
25			0.05	0.004	0.12	0.05		0.01	1.71	1.96	100 %
26			0.04	0.003	0.12	0.03		0.01	1.12	1.32	100 %
Table 19b: Second Assessment											
5	5.00									5.00	100 %
6	96.68									96.68	100 %
7	99.38									99.38	100 %
8	99.64									99.64	100 %
9	98.72				0.91					99.63	100 %
10	87.29				12.41					99.70	100 %
11	84.93				14.76					99.69	100 %
12	85.67				14.12					99.79	100 %
13	78.12	2.56	0.19	0.01	14.18	0.11				95.17	100 %
14	11.95	35.44	5.92	0.39	12.29	2.93				68.92	100 %
15	2.13	36.00	6.92	0.43	11.15	4.06				60.69	100 %
16	0.16	33.66	6.47	0.49	10.48	3.34				54.60	100 %
17		20.70	2.74	0.43	8.95	4.22	0.01	0.01	0.20	37.26	100 %
18		6.53	1.11	0.18	3.07	3.16	0.01	0.21	3.61	17.88	100 %
19		3.07	0.68	0.08	0.91	1.46	0.01	0.24	5.13	11.58	100 %
20		1.05	0.70	0.04	0.44	0.77	0.02	0.17	5.22	8.41	100 %
21		0.03	0.43	0.01	0.31	0.40	0.01	0.11	5.24	6.54	100 %
22			0.30	0.01	0.25	0.28	0.004	0.07	4.98	5.89	100 %
23			0.182	0.006	0.221	0.218	0.002	0.044	4.102	4.775	100 %
24			0.106	0.005	0.179	0.121	0.001	0.028	2.830	3.27	100 %
25			0.053	0.004	0.133	0.064		0.013	1.738	2.005	100 %
26			0.044	0.003	0.126	0.041		0.007	1.137	1.358	100 %

Table 20a: First Assessment

Enrolment in 1965/66 in Schools and Institutions of Higher Education by age group and type of School (absolute numbers)

Age (completed years)	General compulsory schools	Compulsory vocational schools	Intermediate vocational schools	Intermediate schools for the training of teachers and educational assistants	General secondary schools	Secondary vocational schools	Schools for higher social occupations	Teacher training colleges and schools for vocational school teachers	Institutions of higher education including arts academies	Total enrolment	Population
5	6,000									6,000	120,100
6	113,600									113,600	117,500
7	113,000									113,000	113,700
8	111,700									111,700	112,100
9	106,100				900					107,000	107,400
10	88,700				11,600					100,300	100,600
11	83,400				13,300					96,700	97,000
12	82,600				12,500					95,100	95,300
13	74,491	2,408	175	15	12,388	81				89,558	94,100
14	11,276	33,427	5,421	372	10,757	2,281				63,534	94,300
15	2,076	35,097	6,557	424	10,093	3,270				57,517	97,500
16	179	34,631	6,462	517	10,009	2,839				54,637	102,000
17		22,253	2,865	466	8,935	3,744	5	6	215	38,489	107,500
18		6,876	1,130	192	2,998	2,746	15	240	3,745	17,942	105,300
19		2,772	596	72	757	1,090	15	229	4,556	10,087	90,300
20		934	601	35	366	561	15	162	4,556	7,230	88,600
21		34	446	14	313	350	15	122	5,480	6,774	106,400
22			313	8	247	251	5	78	5,236	6,138	106,900
23			197	7	230	202	3	52	4,521	5,212	112,000
24			131	6	214	128	2	38	3,539	4,058	127,000
25			67	5	162	69		18	2,261	2,582	132,100
26			48	4	134	39		9	1,286	1,520	114,800
27 and older			52	5	244	5		17	3,180	3,503	
	793,122	138,432	25,061	2,142	96,147	17,656	75	971	38,575	1,112,181	

Table 20b: Second Assessment

Age (completed years)	General compulsory schools	Compulsory vocational schools	Intermediate vocational schools	Intermediate schools for the training of teachers and educational assistants	General secondary schools	Secondary vocational schools	Schools for higher social occupations	Teacher training colleges and schools for vocational school teachers	Institutions of higher education including arts academies	Total enrolment	Population
5	6,000									6,000	120,100
6	113,600									113,600	117,500
7	113,000									113,000	113,700
8	111,700									111,700	112,100
9	106,027				973					107,000	107,400
10	87,814				12,486					100,300	100,600
11	82,380				14,320					96,700	97,000
12	81,640				13,460					95,100	95,300
13	73,515	2,408	180	15	13,340	100				89,558	94,100
14	11,267	33,427	5,583	366	11,590	2,764				64,997	94,300
15	2,080	35,097	6,752	417	10,871	3,962				59,179	97,500
16	163	34,631	6,657	509	10,780	3,440				56,180	102,900
17		22,253	2,950	459	9,620	4,538	5	6	220	40,051	107,500
18		6,876	1,164	189	3,230	3,327	14	225	3,865	18,830	105,300
19		2,772	614	71	820	1,320	14	214	4,628	10,453	90,300
20		934	620	34	393	680	14	152	4,628	7,455	88,600
21		34	460	14	331	424	14	114	5,568	6,959	106,400
22			322	8	270	304	5	73	5,319	6,301	106,900
23			204	7	248	244	2	49	4,594	5,348	112,800
24			134	6	227	154	2	36	3,594	4,153	127,000
25			70	5	176	84		17	2,296	2,648	132,100
26			50	4	145	47		8	1,305	1,559	114,800
27 and older			54	5	259	6		16	3,229	3,569	
	789,186	138,432	25,814	2,109	103,539	21,394	70	910	39,186	1,120,640	

Table 21a: First Assessment

Enrolment in 1970/71 in Schools and Institutions of Higher Education

As a percentage of the population of the corresponding age group (and type of school)

Age (completed years)	General compulsory schools	Compulsory vocational schools	Intermediate vocational schools	Intermediate schools for the training of teachers and educational assistants	General secondary schools	Secondary vocational schools	Schools for higher social occupations	Teacher training colleges and schools for vocational school teachers	Institutions of higher education including arts academies	Total enrolment
5	4.9									4.9
6	96.9									96.9
7	99.4									99.4
8	99.6									99.6
9	98.7				1.0					99.7
10	88.0				11.8					99.8
11	86.0				13.8					99.8
12	86.1				13.6					99.7
13	82.81		0.16	0.02	13.60	0.08				96.24
14	64.00	2.39	6.14	0.41	13.03	2.78				88.75
15	7.55	34.17	7.09	0.47	12.19	3.80				65.30
16	0.37	37.21	6.54	0.55	11.74	3.69				60.11
17		35.03	3.57	0.52	10.27	3.44	0.01		0.07	52.92
18		22.04	1.72	0.31	4.03	3.35	0.02	0.24	3.89	35.59
19		6.92	0.86	0.16	1.07	1.63	0.04	1.16	5.22	17.07
20		2.65	0.72	0.07	0.46	0.74	0.03	1.25	5.58	11.50
21		0.82	0.45	0.04	0.29	0.44	0.02	0.61	5.27	7.93
22		0.03	0.29	0.02	0.23	0.27	0.01	0.35	4.99	6.18
23			0.19	0.01	0.23	0.22	0.01	0.26	5.16	6.07
24			0.15	0.01	0.24	0.15	0.003	0.22	3.36	4.13
25			0.07	0.01	0.19	0.09		0.14	2.14	2.64
26			0.04	0.004	0.13	0.05		0.06	1.45	1.73

Table 21b: Second Assessment

Age (completed years)	General compulsory schools	Compulsory vocational schools	Intermediate vocational schools	Intermediate schools for the training of teachers and educational assistants	General secondary schools	Secondary vocational schools	Schools for higher social occupations	Teacher training colleges and schools for vocational school teachers	Institutions of higher education including arts academies	Total enrolment
5	4.90									4.90
6	96.90									96.90
7	99.38									99.38
8	99.14									99.14
9	98.60				1.08					99.68
10	86.53				13.22					99.75
11	84.30				15.44					99.74
12	84.40				15.34					99.74
13	84.11		0.18	0.02	15.27	0.12				99.70
14	66.30	2.39	6.93	0.42	14.63	4.33				95.00
15	7.60	34.17	8.01	0.48	13.60	5.92				69.78
16	0.37	37.21	7.39	0.57	12.97	5.76				64.27
17		35.04	4.04	0.54	11.33	5.37	0.01		0.07	56.40
18		22.04	1.95	0.32	4.52	5.22	0.02	0.02	4.15	38.44
19		6.92	0.97	0.17	1.64	2.54	0.04	1.09	5.58	18.95
20		2.65	0.81	0.07	0.63	1.15	0.03	1.17	5.96	12.47
21		0.82	0.50	0.04	0.32	0.68	0.02	0.57	5.63	8.58
22		0.03	0.32	0.02	0.25	0.42	0.01	0.33	5.33	6.71
23			0.21	0.01	0.26	0.34	0.01	0.24	5.51	6.58
24			0.17	0.01	0.28	0.23	0.003	0.20	3.59	4.48
25			0.08	0.01	0.21	0.13		0.13	2.29	2.85
26			0.04	0.004	0.15	0.08		0.05	1.56	1.88

Table 22a: First Assessment

Enrolment in 1970/71 in Schools and Institutions of Higher Education

by age group and type of school in absolute numbers

Age (completed years)	General compulsory schools	Compulsory vocational schools	Intermediate vocational schools	Intermediate schools for the training of teachers and educational assistants	General secondary schools	Secondary vocational schools	Schools for higher social occupations	Teacher training colleges and schools for vocational school teachers	Institutions of higher education including arts academies	Total enrolment	Population
5	6,300									6,300	128,600
6	125,200									125,200	129,200
7	128,200									128,200	129,000
8	126,700									126,700	127,300
9	122,500				1,200					123,700	124,100
10	105,300				14,100					119,400	119,700
11	100,700				16,100					116,800	117,100
12	97,700				15,500					113,200	113,500
13	92,582		177	19	15,206	89				108,073	111,800
14	68,545	2,560	6,573	438	13,959	2,980				95,055	107,200
15	7,567	34,238	7,104	467	12,214	3,806				65,396	100,200
16	355	35,874	6,306	533	11,313	3,560				57,941	96,400
17		33,209	3,386	494	9,739	3,265	8		66	50,167	94,800
18		20,675	1,613	288	3,780	3,142	15	223	3,649	33,385	93,800
19		6,491	803	150	1,005	1,530	40	1,092	4,897	16,008	93,800
20		2,575	701	65	451	715	30	1,214	5,427	11,178	97,200
21		841	462	40	296	448	19	627	5,412	8,145	102,700
22		29	308	17	248	290	10	373	5,342	6,617	107,100
23			194	7	243	230	8	273	5,406	6,361	104,800
24			136	6	218	132	3	194	3,020	3,709	89,800
25			64	5	166	77		124	1,885	2,321	88,100
26			42	4	135	54		58	1,539	1,832	105,900
27 and older			52	5	256	9		98	4,202	4,622	
	981,649	136,492	27,921	2,538	116,129	20,327	133	4,276	40,845	1,330,310	

Table 22b: Second Assessment

Age (completed years)	General compulsory schools	Compulsory vocational schools	Intermediate vocational schools	Intermediate schools for the training of teachers and educational assistants	General secondary schools	Secondary vocational schools	Schools for higher social occupations	Teacher training colleges and schools for vocational school teachers	Institutions of higher education including arts academies	Total enrolment	Population
5	6,300									6,300	128,600
6	125,200									125,200	129,200
7	128,200									128,200	129,000
8	126,200									126,200	127,300
9	122,357				1,343					123,700	124,100
10	103,566				15,834					119,400	119,700
11	98,720				18,080					116,800	117,100
12	95,788				17,412					113.200	113,500
13	94,033		199	20	17,073	140				111,465	111,800
14	71,072	2,560	7,427	453	15,680	4,648				101,840	107,200
15	7,618	34,238	8,026	483	13,622	5,935				69,922	100,200
16	355	35,874	7,127	551	12,503	5,551				61,961	96,480
17		33,209	3,827	512	10,743	5,092	8		70	53,461	94,800
18		20,675	1,823	298	4,240	4,901	15	209	3,895	36,056	93,800
19		6,491	909	155	1,540	2,387	39	1,023	5,230	17,774	93,800
20		2,575	792	67	609	1,116	29	1,137	5,797	12,122	97,200
21		841	520	42	325	697	18	587	5,780	8,810	102,700
22		29	347	18	274	453	10	349	5,705	7,185	107,100
23			218	7	274	358	8	256	5,775	6,896	104,800
24			155	6	250	206	3	182	3,223	4,025	89,800
25			73	5	182	120		116	2,015	2,511	88,100
26			47	4	156	86		54	1,644	1,991	105,900
27 and older			60	5	290	13		92	4,488	4,948	
	979,409	136,492	31,550	2,626	130,430	31,703	130	4,005	43,622	1,359,967	

Table 23a: First Assessment

Enrolment in 1975/1976 in Schools and Institutions of Higher Education

As a percentage of the Population of the Corresponding Age Group and type of School

Age (completed years)	General compulsory schools	Compulsory vocational schools	Intermediate vocational schools	Intermediate schools for the training of teachers and educational assistants	General secondary schools	Secondary vocational schools	Schools for higher social occupations	Teacher training colleges and schools for vocational school teachers	Institutions of higher education including arts academies	Total enrolment
5	4.9									4.9
6	96.9									96.9
7	99.3									99.3
8	99.5									99.5
9	98.6				1.1					99.7
10	87.9				11.9					99.8
11	86.0				13.8					99.8
12	86.1				13.7					99.8
13	82.46		0.15	0.02	13.55	0.08				96.24
14	62.28	2.47	6.35	0.43	12.97	2.98				87.45
15	7.36	34.36	7.33	0.49	11.95	4.03				65.53
16	0.28	36.90	6.72	0.57	11.77	3.97				60.21
17		35.22	3.68	0.53	11.27	3.72	0.004			54.43
18		22.18	1.65	0.31	10.08	3.51	0.02	0.02	0.19	37.95
19		7.29	0.76	0.16	3.02	1.85	0.06	1.19	6.34	20.66
20		3.10	0.55	0.07	0.91	0.87	0.06	1.72	6.57	13.84
21		1.05	0.59	0.04	0.46	0.59	0.05	0.91	6.23	9.90
22		0.04	0.40	0.02	0.33	0.40	0.03	0.48	5.20	6.90
23			0.30	0.01	0.31	0.30	0.02	0.36	4.18	5.47
24			0.20	0.01	0.28	0.18	0.01	0.26	3.44	4.37
25			0.13	0.01	0.20	0.10		0.15	2.35	2.94
26			0.06	0.004	0.06	0.07		0.07	1.53	1.79

Table 23b: Second Assessment

Age (completed years)	General compulsory schools	Compulsory vocational schools	Intermediate vocational schools	Intermediate schools for the training of teachers and educational assistants	General secondary schools	Secondary vocational schools	Schools for higher social occupations	Teacher training colleges and schools for vocational school teachers	Institutions of higher education including arts academies	Total enrolment
5	4.96									4.96
6	96.90									96.90
7	99.36									99.36
8	99.53									99.53
9	98.35				1.34					99.69
10	85.37				14.40					99.77
11	83.07				16.70					99.77
12	83.23				16.54					99.77
13	82.90		0.18	0.02	16.46	0.14				99.70
14	63.37	2.47	7.97	0.43	15.74	5.02				95.00
15	7.43	34.36	9.24	0.49	14.51	6.79				72.82
16	0.43	36.90	8.47	0.57	14.30	6.68				67.26
17		35.23	4.64	0.53	13.67	6.27	0.004			60.344
18		22.18	2.08	[illegible]	12.25	5.91	0.01	0.02	0.24	42.99
19		7.29	0.95	0.15	3.67	3.12	0.05	1.17	7.95	24.35
20		3.10	0.70	0.06	1.10	1.46	0.05	1.70	8.22	16.39
21		1.05	0.74	0.04	0.56	0.99	0.04	0.90	7.79	12.11
22		0.04	0.50	0.02	0.41	0.66	0.02	0.48	6.52	8.65
23			0.38	0.01	0.38	0.50	0.01	0.35	5.24	6.67
24			0.252	0.006	0.337	0.307	0.004	0.257	4.23	5.463
25			0.17	0.01	0.25	0.17		0.15	2.94	3.69
26			0.07	0.004	0.069	0.115		0.069	1.915	2.242

Table 24a: First Assessment

Enrolment in 1975/76 in Schools and Institutions of Higher Education

by age group and type of school in absolute numbers

Age (completed years)	General compulsory schools	Compulsory vocational schools	Intermediate vocational schools	Intermediate schools for the training of teachers and educational assistants	General secondary schools	Secondary vocational schools	Schools for higher social occupations	Teacher training colleges and schools for vocational school teachers	Institutions of higher education including arts academies	Total enrolment	Population
5	6,200									6,200	125,000
6	121,700									121,700	125,600
7	125,000									125,000	125,800
8	126,000									126,000	126,600
9	125,700				1,400					127,100	127,500
10	112,700				15,200					127,900	128,200
11	110,700				17,700					128,400	128,700
12	110,700				17,500					128,200	128,500
13	104,541		184	22	17,183	102				122,032	126,800
14	76,972	3,052	7,821	532	16,029	3,685				108,091	123,600
15	8,787	41,030	8,755	585	14,272	4,813				78,242	119,400
16	321	43,064	7,846	666	13,735	4,629				70,261	116,700
17		39,803	4,160	601	12,729	4,208	5			61,506	113,000
18		24,705	1,839	340	11,231	3,909	20	23	210	42,277	111,400
19		7,767	809	166	3,218	1,973	60	1,265	6,762	22,020	106,600
20		3,086	551	65	904	966	55	1,715	6,541	13,783	99,600
21		1,001	563	38	438	561	45	873	5,958	9,477	95,700
22		36	376	18	315	370	25	453	4,902	6,495	94,200
23			283	7	284	279	15	333	3,897	5,098	93,200
24			186	6	263	171	5	242	3,199	4,072	93,100
25			127	5	196	100		147	2,263	2,838	96,500
26			58	4	61	70		72	1,563	1,828	102,200
27 and older			109	5	291	13		120	4,470	5,008	
	1,029,321	163,544	33,667	3,060	142,949	25,749	230	5,243	39,765	1,443,528	

Table 24b: Second Assessment

5	6,200									6,200	125,000
6	121,700									121,700	125,600
7	125,000									125,000	125,800
8	126,000									126,000	126,600
9	125,395				1,705					127,100	127,500
10	109,445				18,455					127,900	128,200
11	106,910				21,490					128,400	128,700
12	106,950				21,250					128,200	128,500
13	105,118		235	22	20,870	175				126,420	126,800
14	78,318	3,052	9,855	529	19,460	6,206				117,420	123,600
15	8,877	41,030	11,030	582	17,325	8,105				86,949	119,400
16	395	43,064	9,885	663	16,685	7,798				78,490	116,700
17		39,803	5,245	598	15,450	7,086	4			68,186	113,000
18		24,705	2,316	338	13,645	6,585	17	23	264	47,893	111,400
19		7,767	1,018	165	3,910	3,324	53	1,247	8,470	25,954	106,600
20		3,086	696	65	1,095	1,457	48	1,691	8,191	16,329	99,600
21		1,001	708	38	540	945	39	861	7,459	11,591	95,700
22		36	475	18	381	625	22	447	6,140	8,144	94,200
23			356	7	350	468	13	328	4,880	6,402	93,200
24			235	6	314	286	4	239	4,003	5,087	93,100
25			161	5	245	169		145	2,833	3,558	95,500
26			72	4	70	117		71	1,957	2,291	102,200
27 and older			136	5	350	22		118	5,597	6,228	
	1,020,308	163,544	42,423	3,045	173,590	43,368	200	5,171	49,794	1,501,443	

Table 25a

First Assessment: Pupil output as a percentage of the relevant age groups(a)

A. Compulsory school level

Pupils successfully completing:

School type	Birth cohorts(b)					
	1937/40	1941/44	1945/48	1949/52	1953/56	1957/60
Primary school						
8th grade	17.6	16.7	16.8	18.3	23.7	23.5
7th grade or lower	27.8	18.3	16.2	14.7	7.9	7.4
Upper primary school						
4th year	33.8	42.9	43.1	44.9	49.5	50.0
3rd year or lower	10.7	8.4	8.8	7.0	2.5	2.5
Special school						
8th grade	0.2	0.5	0.7	1.0	1.5	1.7
7th grade or lower	1.5	1.9	2.6	2.4	1.9	1.8
General secondary school						
4th year	8.1	11.0	11.5	11.5	12.8	12.9
Total: all schools and all grades (or years)	99.7	99.7	99.7	99.8	99.8	99.8
Total: all schools, 8th grade and 4th year	59.7	71.1	72.1	75.7	87.5	88.1

(a) The calculation is based on the size of the 14-year-old age group - i.e. from 14 years, 0 months, to 14 years, 11 months, 30 days; it would have been too complicated to try to take account of all the variations in the actual ages of pupils completing a given educational level.

(b) Read as follows: of the total population of 14-year-olds in the birth cohorts 1937 to 1940 an average, of 17.6 per cent successfully completed the 8th grade of primary school.

Table 25b

Second Assessment: Pupil output as a percentage of the relevant age groups

A. Compulsory school level

Pupils successfully completing:

School type	Birth cohorts					
	1937/40	1941/44	1945/48	1949/52	1953/56	1957/60
Primary school						
8th grade	17.6	16.7	16.8	18.3	18.8	15.1
7th grade or lower	27.8	18.3	16.2	14.7	6.2	4.9
Upper primary school						
4th grade	33.8	42.9	43.1	44.9	52.3	55.6
3rd grade or lower	10.7	8.4	8.8	7.0	4.2	4.8
Special school						
8th grade	0.2	0.5	0.7	1.0	1.6	1.7
7th grade or lower	1.5	1.9	2.6	2.4	1.9	2.0
General secondary school						
4th grade	8.1	11.0	11.5	11.5	14.8	15.7
Total	99.7	99.7	99.7	99.8	99.8	99.8
Total: all schools 8th grade and 4th year	59.7	71.1	72.1	75.7	87.5	88.1

Table 25c

First Assessment: Pupil output as a percentage of the relevant age groups

B. Attendance in the polytechnic course

	Birth cohort			
	1945/48	1949/52	1953/56	1957/60
Total overall percentages of pupils completing 8th grade or equivalent[(a)]	72.1	75.7	87.5	88.1
Percentage of these attending the polytechnic course upon leaving each of the following types of school:				
Primary school	-	3.9	15.0	15.1
Upper primary school	-	5.0	20.9	20.2
Special school	-	0.1	0.5	0.5
General secondary school	-	0.0	0.0	0.0
Total		9.0[(b)]	36.4	35.8

(a) From column 9 of Table 25a.

(b) Pupils born in 1952 will be the first who have to attend school for nine years.

Table 25d

Second Assessment: Pupil output as a percentage of the relevant age groups

B. Attendance in the polytechnic course

	Birth cohorts					
	1937/40	1941/44	1945/48	1949/52	1953/56	1957/60
Output of pupils who successfully complete the 8th grade:						
Percentage of these attending the polytechnic course upon leaving each of the following types of schools:						
Primary school	-	-	-	3.9	12.5	11.3
Upper primary school	-	-	-	5.0	17.4	16.2
Special school	-	-	-	0.1	0.4	0.4
Total	-	-	-	9.0	30.5	27.9
Total: all schools	59.7	71.1	72.1	75.7	87.5	88.1

Total 25e

Pupil output as a percentage of the relevant age groups[(b)]

C. Compulsory vocational schools and intermediate vocational schools

	Birth cohorts	
	1937/44[(c)]	1945/56
Pupils having successfully completed:		
Compulsory vocational school	32.7	39.0
Trade, technical and arts-and-crafts school	2.2	2.2
A class of a school for master craftsmen, construction workers or foremen	0.6	0.7
Commercial school	3.6	3.4
Vocational school for women's domestic and catering occupations .	2.7	2.7
Vocational school for social workers	0.0	0.1
Intermediate school for the training of teachers and educational assistants[(a)]	0.4	0.1

(a) These include: schools for women handicraft teachers, schools for educational assistants (plus secondary teacher training schools), and schools for teachers of domestic science and vocational subjects (expiring - see Chapter I, Section A4, with regard to teacher training reforms).

(b) The calculation is based on the size of the 14-year-old age group. See note (a) to Part A of this table.

(c) Read as follows: of the total population of 14-year-olds in the birth cohorts 1937-1944, an average of 32.7 per cent successfully completed a compulsory vocational school.

Table 26a

First Assessment: Pupil output as a percentage of the population of the relevant age groups(c)

A. Secondary schools

School type	Birth cohorts					
	1933/36(d)	1937/40	1941/44	1945/48	1949/52	1953/56
School leavers having passed the leaving examination:						
Grammar or general secondary school(a).	3.7	3.8	6.1	6.0	7.0(d)	7.3
Old-type secondary school for the training of teachers . .	0.9	0.7	0.9	1.8	0.2	-
Grammar school mainly for future teachers	-	-	-	-	1.9	2.1
Secondary technical and trade school	0.9	1.0	1.5	1.7	1.7	1.7
Business academy	1.0	1.2	1.7	1.6	1.4	1.4
Secondary school for women's domestic and catering occupations(b)	0.1	0.2	0.3	0.3	0.3	0.3
Total	6.6	6.9	10.5	11.1	12.5	12.8

Table 26b

Second Assessment: Pupil output as a percentage of the population of the relevant age groups(c)

A. Secondary schools

School type	Birth cohorts					
	1933/36(d)	1937/40	1941/44	1945/48	1949/52	1953/56
School leavers having passed the leaving examination:						
Grammar school and general secondary school(a).	3.7	3.8	6.1	6.0	8.3	8.6
Secondary school for the training of teachers	0.9	0.7	0.9	1.8	0.2	-
Grammar school mainly for future teachers	-	-	-	-	2.2	2.5
Secondary technical and trade school	0.9	1.0	1.5	1.7	2.2	2.9
Business academy	1.0	1.2	1.7	1.6	1.4	1.9
Secondary school for women's domestic and catering occupations(b)	0.1	0.2	0.3	0.3	0.4	0.4
Total	6.6	6.9	10.5	11.1	14.5	16.3

(a) Excluding grammar schools mainly for future teachers.

(b) Including the expiring 4-year secondary school for women's domestic and catering occupations; the new type is a 5-year school.

(c) The calculation is based on the size of the relevant (18-year-old) age group. See note (a) to Table 25a.

(d) Read as follows: of the total population of 17-year-olds in the birth cohorts 1933/36, an average of 3.7 per cent successfully completed (with leaving examination) a grammar school (general secondary school).

Table 26c

First Assessment: Student output as a percentage of the population of the relevant age groups[c]

B. Third level of education (institutions of higher education, and academies and related institutions)

	Birth cohorts					
	1933/36[d]	1937/40	1941/44	1945/48	1949/52	1953/56
School leavers having passed the qualifying examination of a:						
New-type teacher training college	-	-	-	-	1.8	2.0
New-type school for vocational school teachers	-	-	-	-	0.1	0.1
School leavers having passed the leaving examination at a school for higher social occupations .	-	-	-	-	0.1	0.1
School leavers having acquired a "first degree"[a] at an institution of higher education[b]	2.4	3.0	4.1	4.4	4.4	4.5
Total	2.4	3.0	4.1	4.4	6.4	6.7

(a) Including those graduates who after having acquired a first degree wish to take a second degree and therefore remain at the respective institution of higher education. The following are recognised as first degrees: translator's examination, leaving examination of arts academy, third state examination in law or political science.

(b) Including art academies.

(c) The calculation is based on the size of the relevant age group. See note (a) to Table 25a.

(d) Read as follows: of the total population of 18-year-olds in the birth cohorts 1933/36, an average of 2.4 per cent acquired a first degree.

3. UNIVERSITY STUDENT CHARACTERISTICS TABLES

Definitions and explanatory notes relevant to the tables on the composition of university student bodies

Full-time students are students who satisfy all the admission requirements of an institution of higher education and who wish to conclude their studies with the prescribed examinations.

Part-time students are students who wish only to attend one or more lectures. They cannot pursue a regular academic programme or take the final examinations except in cases where they are regularly enrolled for their main field of study in another institution of higher education or in another department.

Persons who were formerly enrolled in an institution of higher education and who concluded their studies with a final examination may become special students. They are entitled to participate in courses which they need for their further education.

Foreign students are students who are not of Austrian nationality, i.e.,inclusive of stateless persons and persons whose nationality is not known.

Main fields of study:

Theology: Roman Catholic Theological Faculties at the Universities of Vienna, Graz, Innsbruck and Salzburg and the Protestant Theological Faculty in Vienna.

Law and Political Science: Schools of Law and Political Science at the Universities of Vienna, Graz and Innsbruck including the School of Economics at Innsbruck.

Medicine: Medical Schools at the Universities of Vienna, Graz and Innsbruck.

Liberal Arts (including Science): Various fields of study at the Schools of Liberal Arts at the Universities of Vienna, Graz, Innsbruck and Salzburg.

Technology: Schools of Technology having university status in Vienna and Graz.

Mining: School of Mining at Leoben.

Agriculture: School of Agriculture in Vienna.

Veterinary Medicine: School of Veterinary Medicine in Vienna.

Arts: Academy of Fine Arts in Vienna, Academy of Applied Arts in Vienna and Academies of Music and Dramatics in Vienna, Salzburg and Graz.

Table 27

Development of enrolment in institutions of higher education in Austria since 1953-54

Academic year (winter term)	Enrolment									
	Total enrolment	Female students	Students of Austrian nationality	Foreign students	Full-time students		Beginning students (freshmen)			
					Students of Austrian nationality	Foreign students	Students of Austrian nationality	Foreign students	Full-time students	
									Students of Austrian nationality	Foreign students
Absolute numbers										
1953-54	20,011	4,149	16,782	3,229	15,000	3,015	3,813	690	3,052	554
54-55	19,954	4,027	16,415	3,539	14,625	3,324	3,990	802	3,175	697
55-56	21,093	4,319	16,544	4,549	14,809	4,315	3,904	1,226	3,188	1,090
56-57	22,850	4,863	16,724	6,126	15,000	5,863	3,947	1,480	3,282	1,358
57-58	27,296	6,043	18,920	8,376	17,065	8,017	5,389	1,945	4,647	1,785
58-59	32,608	7,691	22,593	10,015	20,270	9,534	6,900	1,883	5,905	1,682
59-60	36,110	8,531	25,867	10,243	23,568	9,786	7,750	1,613	6,730	1,428
1960-61	40,815	9,648	30,009	10,806	28,159	10,374	8,118	1,495	7,229	1,281
61-62	45,110	10,844	33,762	11,348	31,858	10,787	8,186	1,574	7,480	1,255
62-63	48,340	11,873	37,064	11,276	35,007	10,655	8,306	1,732	7,472	1,404
63-64	50,256	12,335	39,876	10,380	37,629	9,641	7,938	1,413	7,053	1,076
1964-65	51,402	12,657	41,128	10,274	38,714	9,368	7,785	1,595	6,784	1,139
65-66	52,169	12,822	41,850	10,319	39,457	9,438	7,829	1,535	6,935	1,129
Index numbers (1953-54 = 100)										
1954-55	100	97	98	110	97	110	105	116	104	126
55-56	105	104	99	141	99	143	102	178	104	197
56-57	114	117	100	190	100	194	104	214	108	245
57-58	136	146	113	259	114	266	141	282	152	322
58-59	163	185	135	310	135	316	181	273	193	304
59-60	180	206	154	317	157	325	203	234	221	258
1960-61	204	233	179	335	188	344	213	217	237	231
61-62	225	261	201	351	212	358	215	228	245	227
62-63	242	286	221	349	233	353	218	251	245	253
63-64	251	297	238	321	251	320	208	205	231	194
1964-65	257	305	245	318	258	311	204	231	222	206
65-66	261	309	249	320	263	313	205	222	227	204

Table 28

Distribution of female students, Austrian and foreign, and freshmen at the institutions of higher education

1953/54-1964/65

Academic year (Winter term)	Of 100 students the following numbers were:				Of 100 first-year students the following numbers were:		Foreigners per 100 full-time students of Austrian nationality	
	Women	Students of Austrian nationality	Foreign students	Beginning students (freshmen)	Of Austrian nationality	Foreign students	All foreigners	Those in their first term
1953/54	21	84	16	23	85	15	20	18
1954/55	20	82	18	24	83	17	23	22
1955/56	20	78	22	24	76	24	29	34
1956/57	21	73	27	24	73	27	39	41
1957/58	22	69	31	27	73	27	47	38
1958/59	24	69	31	27	79	21	47	28
1959/60	24	72	28	26	83	17	42	21
1960/61	24	74	26	24	84	16	37	18
1961/62	24	75	25	22	84	16	34	17
1962/63	25	77	23	21	83	17	30	19
1963/64	25	79	21	19	85	15	26	15
1964/65	25	80	20	18	83	17	24	17
1965/66	25	80	20	18	84	16	24	16

Table 29

Full-time students of Austrian nationality at institutions of higher education, by age group, 1965/66

Age (completed years of age)	Male students in absolute numbers		Per 1,000 of the male population		Female students in absolute numbers		Per 1,000 of the female population	
18	1,339		24		945		18	
19	2,059		42		1,192		26	
20	2,869		71		1,235		31	
21	4,167		78		1,569		30	
		23,953		55		8,598		20
22	4,106		76		1,455		28	
23	3,695		68		999		19	
24	3,205		51		765		13	
25	2,523		37		438		7	
26	1,688		26		227		4	
27	718		16		108		3	
		3,185		17		463		3
28	456		11		72		2	
29	323		8		56		1	

Table 30

Full-time Austrian students by age and main fields of study

Absolute and relative numbers - 1965-66

	Age (completed years of age)	Theology			Law and political science			Medicine			Liberal arts			Technology			
		Abs.	%		Abs.	%		Abs.	%		Abs.	%		Abs.	%		
1	17	-	-	73	-	-	81	-	-	93	-	-	87	1	0.0	83	1
2	18	30	4.3		342	4.9		360	8.5		853	7.3		347	4.1		2
3	19	46	6.6		587	8.4		502	11.8		1,079	9.2		528	6.3		3
4	20	61	8.8		751	10.7		598	14.0		1,344	11.4		735	8.7		4
5	21	72	10.4		1,115	15.9		767	18.0		1,812	15.4		1,069	12.7		5
6	22	92	13.2		1,028	14.7		675	15.9		1,746	14.8		1,171	13.9		6
7	23	79	11.4		792	11.3		522	12.3		1,379	11.7		1,135	13.4		7
8	24	75	10.8		615	8.8		355	8.3		1,166	9.9		1,114	13.2		8
9	25	54	7.8		448	6.4		192	4.5		809	6.9		938	11.1		9
10	26	43	6.2	16	361	5.2	11	98	2.3	4	480	4.1	8	635	7.5	13	10
11	27	27	3.9		157	2.3		36	0.9		218	1.9		249	3.0		11
12	28	14	2.0		122	1.7		28	0.7		142	1.2		143	1.7		12
13	29	25	3.6		94	1.3		18	0.4		107	0.9		82	1.0		13
14	30	10	1.4	6	81	1.2	4	13	0.3	1	72	0.6	2	51	0.6	2	14
15	31	8	1.2		40	0.6		10	0.2		70	0.6		44	0.5		15
16	32	11	1.6		52	0.7		6	0.1		52	0.4		31	0.4		16
17	33	8	1.2		52	0.7		6	0.1		47	0.4		33	0.4		17
18	34	2	0.3		44	0.6		6	0.1		38	0.3		28	0.3		18
19	35	4	0.6	2	36	0.5	2	3	0.1	1	28	0.2	1	21	0.2	1	19
20	36	3	0.4		33	0.5		4	0.1		35	0.3		14	0.2		20
21	37	1	0.1		26	0.4		8	0.2		27	0.2		10	0.1		21
22	38	3	0.4		19	0.3		4	0.1		30	0.3		8	0.1		22
23	39	4	0.6		20	0.3		4	0.1		16	0.1		2	0.0		23
24	40 and over	22	3.2	3	169	2.4	2	33	0.8	1	198	1.7	2	44	0.5	1	24
25	Unknown	-	-	-	12	0.2	0	10	0.2	0	24	0.2	0	10	0.1	0	25
26	Total	694	100.0	100	6,996	100.0	100	4,258	100.0	100	11,772	100.0	100	8,443	100.0	100	26

Table 30 (continued)

	A g e (completed years of age)	Mining			Agriculture			Veterinary medicine			Business and commerce			Arts			
		Abs.	%		Abs.	%		Abs.	%		Abs.	%		Abs.	%		
1	17	-	-	79	-	-	87	-	-	92	-	-	89	6	0.4	82	1
2	18	10	1.6		65	5.2		11	6.0		265	7.0		84	6.0		2
3	19	24	3.9		90	7.0		27	14.6		368	9.7		103	7.4		3
4	20	42	6.8		121	9.5		21	11.3		431	11.3		134	9.6		4
5	21	68	10.9		182	14.2		34	18.3		617	16.2		188	13.4		5
6	22	90	14.5		196	15.3		20	10.8		543	14.3		217	15.5		6
7	23	95	15.3		215	16.8		23	12.4		444	11.7		156	11.1		7
8	24	74	11.9		145	11.3		18	9.7		408	10.7		156	11.1		8
9	25	86	13.9		100	7.8		16	8.6		318	8.3		108	7.7		9
10	26	57	9.2	17	69	5.4	10	3	1.6	4	169	4.4	8	68	4.9	11	10
11	27	24	3.9		28	2.2		3	1.6		84	2.2		34	2.4		11
12	28	17	2.7		21	1.6		1	0.5		40	1.0		26	1.9		12
13	29	8	1.3		13	1.0		1	0.5		31	0.8		19	1.4		13
14	30	6	1.0	3	9	0.7	2	1	0.5	0	22	0.6	2	17	1.2	3	14
15	31	3	0.5		4	0.3		-	-		9	0.2		9	0.6		15
16	32	2	0.3		2	0.2		-	-		12	0.3		11	0.8		16
17	33	3	0.5		4	0.3		-	-		8	0.2		5	0.4		17
18	34	2	0.3		1	0.1		-	-		9	0.2		7	0.5		18
19	35	2	0.3	1	2	0.2	1	1	0.5	2	6	0.2	0	11	0.8	2	19
20	36	2	0.3		2	0.2		-	-		3	0.1		-	-		20
21	37	1	0.2		2	0.2		-	-		1	0.0		2	0.1		21
22	38	2	0.3		1	0.1		1	0.5		1	0.0		3	0.2		22
23	39	-	-		1	0.1		1	0.5		-	-		6	0.4		23
24	40 and over	1	0.2	0	4	0.3	0	3	1.6	2	21	0.6	1	19	1.4	1	24
25	Unknown	1	0.2	0	-	-	-	1	0.5	0	-	-	-	11	0.8	1	25
26	Total	620	100.0	100	1,278	100.0	100	186	100.0	100	3,810	100.0	100	1,400	100.0	100	26

Table 31

Full-time Austrian students in their first and second semester by age and main fields of study

Absolute and relative numbers(1)

	A g e (completed years of age)	Theology			Law and political science			Medicine			Liberal arts			Technology			
		Abs.	%		Abs.	%		Abs.	%		Abs.	%		Abs.	%		
1	17	-	-	59	-	-	61	-	-	89	-	-	80	1	0.1	84	1
2	18	30	21.1		342	20.1		360	42.4		853	35.9		347	31.4		2
3	19	25	17.6		299	17.6		237	27.9		521	21.9		289	26.2		3
4	20	15	10.6		197	11.6		103	12.1		301	12.7		169	15.3		4
5	21	14	9.9		200	11.8		54	6.4		234	9.9		120	10.9		5
6	22	12	8.5	21	115	6.8	22	27	3.2	8	116	4.9	12	59	5.3	13	6
7	23	5	3.5		105	6.2		15	1.8		66	2.8		35	3.2		7
8	24	8	5.7		80	4.7		13	1.5		59	2.5		34	3.1		8
9	25	5	3.5		79	4.7		10	1.2		46	1.9		15	1.3		9
10	26	5	3.5	12	60	3.5	8	8	0.9	2	41	1.7	4	10	0.9	3	10
11	27	3	2.1		33	1.9		3	0.4		20	0.9		8	0.7		11
12	28	3	2.1		23	1.4		7	0.8		17	0.7		5	0.4		12
13	29	6	4.2		22	1.3		3	0.4		8	0.3		4	0.4		13
14	30 to 34	4	2.8	3	66	3.9	4	3	0.4	0	39	1.6	2	4	0.4	0	14
15	35 and over	7	4.9	5	77	4.5	5	5	0.6	1	52	2.2	2	3	0.3	0	15
16	Unknown	-	-	-	-	-	-	-	-	-	2	0.1	0	1	0.1	0	16
17	Total	142	100.0	100	1,698	100.0	100	848	100.0	100	2,375	100.0	[illegible]00	1,104	100.0	100	17

(1) Where the absolute figures were below 100 no relative figures were calculated.

This table shows the age of students at the time they start their present studies. Included are students in their first term who have already completed another course of study or have switched to another field of study.

Table 31 (continued)

	Age (completed years of age)	Mining	Agriculture			Veterinary medicine	Business and commerce			Arts			
		Absolute	Abs.	%		Absolute	Abs.	%		Abs.	%		
1	17	-	-	-	81	-	-	-	76	6	1.9	64	1
2	18	10	64	25.8		11	264	27.7		64	20.2		2
3	19	14	61	24.6		17	194	20.3		49	15.4		3
4	20	7	43	17.4		10	140	14.7		39	12.3		4
5	21	7	33	13.3		5	123	12.9		44	13.9		5
6	22	3	16	6.5	14	3	67	7.0	19	33	10.4	24	6
7	23	2	10	4.0		4	52	5.5		17	5.4		7
8	24	1	5	2.0		1	25	2.6		17	5.4		8
9	25	3	4	1.6		1	35	3.7		10	3.1		9
10	26	2	6	2.4	4	1	20	2.1	4	6	1.9	4	10
11	27	2	1	0.4		-	9	0.9		4	1.3		11
12	28	-	2	0.8		-	7	0.7		4	1.3		12
13	29	-	1	0.4		-	6	0.6		-	-		13
14	30 to 34	2	1	0.4	1	-	9	0.9	1	9	2.8	3	14
15	35 and over	1	1	0.4		1	4	0.4	0	12	3.8	4	15
16	Unknown	-	-	-	-	-	-	-	-	3	0.9	1	16
17	Total	54	248	100.0	100	54	955	100.0	100	317	100.0	100	17

Table 32

Full-time Austrian students by regularly enrolled terms and main fields of study

Absolute and relative numbers - 1965-66

	In their ... regularly enrolled term	Theology			Law and political science			Medicine			Liberal arts			Technology			
		Abs.	%		Abs.	%		Abs.	%		Abs.	%		Abs.	%		
1	1st & 2nd	142	20.5	90	1,698	24.3	90	848	19.9	87	2,375	20.2	80	1,104	13.1	64	1
2	3rd " 4th	132	19.0		1,336	19.1		745	17.5		1,901	16.1		1,018	12.1		2
3	5th " 6th	103	14.8		1,237	17.7		801	18.8		1,788	15.2		987	11.7		3
4	7th " 8th	119	17.2		1,201	17.2		694	16.3		1,748	14.8		1,081	12.8		4
5	9th " 10th	129	18.6		828	11.8		601	14.1		1,634	13.9		1,195	14.1		5
6	11th " 12th	37	5.3	9	378	5.4	10	393	9.2	13	1,137	9.7	19	1,109	13.1	34	6
7	13th " 14th	18	2.6		203	2.9		118	2.8		659	5.6		880	10.4		7
8	15th " 16th	3	0.4		56	0.8		29	0.7		307	2.6		505	6.0		8
9	17th " 18th	3	0.4		20	0.3		11	0.2		103	0.9		267	3.2		9
10	19th " 20th	1	0.2		11	0.1		2	0.1		47	0.4		103	1.2		10
11	21st " over	3	0.4	0	13	0.2	0	2	0.1	0	28	0.2	0	138	1.6	1	11
12	Unknown	4	0.6	1	15	0.2	0	14	0.3	0	45	0.4	1	56	0.7	1	12
13	Total	694	100.0	100	6,996	100.0	100	4,258	100.0	100	11,772	100.0	100	8,443	100.0	100	13

This table supplies information on how long students remain at an institution of higher education in pursuing their studies in their chosen field, but does not say anything about the progress made. See next table for comparison of required and average actual numbers of semesters taken to complete degree programmes.

Table 32 (continued)

	In their ... regularly enrolled term	Mining			Agriculture			Veterinary medicine			Business and commerce			Arts			
		Abs.	%		Abs.	%		Abs.	%		Abs.	%		Abs.	%		
1	1st & 2nd	54	8.7		248	19.4		54	29.0		955	25.1		317	22.7		1
2	3rd " 4th	82	13.2		205	16.1		44	23.7		790	20.7		307	21.9		2
3	5th " 6th	96	15.5	72	208	16.3	81	32	17.2	95	746	19.6	95	279	19.9	87	3
4	7th " 8th	116	18.7		207	16.2		29	15.6		678	17.8		199	14.2		4
5	9th " 10th	99	16.0		171	13.4		17	9.2		435	11.4		122	8.7		5
6	11th " 12th	86	13.9		127	9.9		3	1.6		154	4.0		83	5.9		6
7	13th " 14th	44	7.1		55	4.3		1	0.5		42	1.1		36	2.6		7
8	15th " 16th	23	3.7	26	21	1.6	17	-	-	3	6	0.2	5	11	0.8	10	8
9	17th " 18th	9	1.4		7	0.6		1	0.5		3	0.1		4	0.3		9
10	19th " 20th	-	-		5	0.4		-	-		1	0.0		-	-		10
11	21st " over	3	0.5	1	3	0.2	0	3	1.6	1	-	-	-	1	0.1	0	11
12	Unknown	8	1.3	1	21	1.6	2	2	1.1	1	-	-	-	41	2.9	3	12
13	Total	620	100.0	100	1,278	100.0	100	186	100.0	100	3,810	100.0	100	1,400	100.0	100	13

Table 33

Required and average actual length of time to complete university degree programmes

Field	Required No. of semesters	Actual number of semesters (average)	Institution of higher education
1. Theology	10 (Vienna, Graz) 12 (Innsbruck, Salzburg)	10-12	All universities
2. Protestant Theology	8	9	University of Vienna only
3. Law	8	9	University of Vienna, Graz, Innsbruck
4. Political sciences .	8	9	University of Vienna, Graz, Innsbruck
5. Economics			University of Innsbruck
(a) Diploma	6	7	
(b) PhD	8	9-10	
6. Science of commerce			Business school
(a) Diploma	6	7-8	
(b) PhD	8	9-10	
(c) Secondary school teaching qualifications	8	9-10	
7. Medicine	10	11-13	University of Vienna, Graz, Innsbruck
8. Liberal arts			All universities (in Salzburg Humanities only)
(a) Humanities . . .	8	9	
(b) Sciences, especially	8	9-10	
Chemistry:	8	14-16	
Physics:	8	10-12	
9. Pharmacy	6	7-8	
10. Interpreter's school			University of Vienna, Graz, Innsbruck
(a) Translator's examination . .	5	6-7	
(b) Diploma	7	8-10	
11. Civil engineering .	9	12-15	School of Engineering, Vienna, Graz
12. Architecture	8	10-12	School of Engineering, Vienna, Graz
13. Mechanical engineering	9	10-12	School of Engineering, Vienna, Graz
14. Engineering processes	9	10-12	School of Engineering, Vienna
15. Industrial organisation	9	10-11	School of Engineering, Vienna
16. Traffic engineering and vehicle design	9	10-12	School of Engineering, Vienna
17. Electrical engineering	9	15-16	School of Engineering, Vienna, Graz
18. Communication engineering . . .	9	13-15	School of Engineering, Vienna
19. Marine engineering	9	13-15	School of Engineering, Vienna
20. Chemical engineering	9	12-13	School of Engineering, Vienna, Graz
21. Engineering physics	8	11-12	School of Engineering, Vienna, Graz

Table 33 continued

Field	Required No. of semesters	Actual number of semesters (average)	Institution of higher education
22. Gas dynamics	9	10-11	School of Engineering, Vienna
23. Surveying	8	8-10	School of Engineering, Vienna, Graz
24. Engineering processes paper production	8	9-11	School of Engineering, Graz
25. Production and industrial management	9	10-12	School of Engineering, Graz
26. Actuarial theory . .	6	6-8	School of Engineering, Vienna, Graz
27. Engineering . . . . mathematics	8	9-10	School of Engineering, Vienna
28. Secondary school . . teaching qualifications	8	9-10	Universities and Schools of Engineering
29. Mining	8	9-10	School of Mines
30. Mine-surveying . . .	8	9-10	School of Mines
31. Petroleum . . . . . engineering	8	9-10	School of Mines
32. Metallurgy	8	9-10	School of Mines
33. Agriculture	8	9-10	School of Agriculture
34. Forestry	8	9-10	School of Agriculture
35. Cultivation . . . . techniques	9	10-11	School of Agriculture
36. Fermenting . . . . . processes	8	9-10	School of Agriculture
37. Veterinary medicine	9	10-11	Veterinary School
38. Computer . . . . . sciences	4	4	School of Engineering, Vienna
39. International . . . studies	2	2	University of Vienna
40. Course in tourism .	4	4	Business School
41. Course in adver- . . tising and marketing	4	4	Business School

Table 34

Full-time Austrian students - change of field of study or institution and studies abroad

Relative numbers - 1965/66

	Of 100 students the following numbers have:			
	Changed field of study or institution	Changed field of study	Changed institution	Gone to study abroad
By institution of higher learning				
University of Vienna	15	13	2	3
University of Graz	14	10	4	3
University of Innsbruck	15	10	5	4
University of Salzburg	16	2	14	5
School of Technology in Vienna	7	5	2	1
School of Technology in Graz	8	5	3	1
School of Mining at Leoben	5	1	4	0
School of Agriculture in Vienna	12	1	11	1
School of Veterinary Medicine in Vienna .	19	-	19	2
School of Business and Commerce in Vienna	11	-	11	2
Academy of Fine Arts	16	5	11	4
Academy of Applied Arts	14	3	11	2
Academy of Music and Dramatics in Vienna	12	2	10	2
Academy of Music and Dramatics in Salzburg	6	1	5	3
Academy of Music and Dramatics in Graz	8	2	6	2
By main field of study				
Theology	11	3	8	8
Law and political science	18	16	2	2
Medicine	8	6	2	1
Liberal arts	15	12	3	5
Technology	7	5	2	1
Mining	5	1	4	0
Agriculture	12	[illegible]	11	1
Veterinary medicine	19	[illegible]	19	2
Business and commerce	11	-	11	2
Arts	11	2	9	2
Overall percentage of Austrian students .	12	8	4	3

Table 35

Full-time Austrian students with or without study grants or scholarships

Absolute and relative numbers - 1964/65

	Male students		Female Students	
	Abs.	%	Abs.	%
By marital status				
With study grants or scholarships				
Single	6,402	92	1,933	94
Married	512	7	118	6
Widowed or divorced	12	0	10	0
Unknown	29	1	4	0
Without study grants or scholarships				
Single	19,170	88	7,225	93
Married	2,504	11	494	6
Widowed or divorced	95	0	85	1
Unknown	100	1	21	0
By place of permanent residence				
With study grants or scholarships				
Permanent residence in the same locality as the institution	2,478	36	1,078	52
Permanent residence not in the same locality	4,477	64	987	48
Without study grants or scholarships				
Permanent residence in the same locality as the institution	11,052	51	4,645	59
Permanent residence not in the same locality	10,817	49	3,180	41

Table 36

Full-time Austrian students by main field of study and fathers' occupation

Absolute and relative numbers - 1965-66

Occupations of fathers	Theology		Law and political science		Medicine		Liberal arts		Technology	
	Abs.	%	Abs.	%	Abs.	%	Abs.	%	Abs.	%
1 Self employed	272	39	2,025	29	1,949	46	2,827	24	2,073	25
2 Industry	3	0	96	1	28	1	76	1	76	1
3 Commerce	14	2	274	4	137	3	341	3	247	3
4 Agriculture	153	22	151	2	68	2	212	2	100	1
5 Artisans	39	6	265	4	97	2	451	4	388	5
6 Professional	25	4	720	10	1,309	31	1,206	10	738	9
7 No particulars	38	5	519	8	310	7	541	4	524	6
8 Employees	211	30	3,677	53	1,839	43	6,685	57	4,705	56
9 Of these senior civil servants and privately employed persons in leading positions	81	12	1,616	23	1,012	24	2,859	24	1,597	19
10 Civil servants at the lower positions and privately employed persons in other than leading positions	63	9	816	12	311	7	1,718	15	1,416	17
11 No particulars	67	9	1,245	18	516	12	2,108	18	1,692	20
12 Workers	90	13	327	5	114	3	651	6	515	6
13 Retired workers and employees	116	17	878	12	309	2	1,470	12	960	11
14 Occupation unknown	5	1	89	1	47	1	139	1	190	2
15 Total	694	100	6,996	100	4,258	100	11,772	100	8,443	100

Table 36 (continued)

Occupations of fathers	Mining		Agriculture		Veterinary medicine		Business and commerce		Arts		Total	
	Abs.	%	Abs.	%	Abs.	%	Abs.	%	Abs.	%	Abs.	%
1 Self employed	108	17	390	31	98	53	1,256	33	402	29	11,400	29
2 Industry	2	0	4	0	2	1	73	2	6	0	366	1
3 Commerce	19	3	37	3	30	16	301	8	58	4	1,458	4
4 Agriculture	5	1	138	11	-	-	79	2	42	3	948	2
5 Artisans	12	2	36	3	6	3	264	7	55	4	1,613	4
6 Professional	34	5	74	6	60	33	214	6	188	14	4,568	12
7 No particulars	36	6	101	8	-	-	325	8	53	4	2,447	6
8 Employees	356	57	676	53	65	35	1,837	48	686	49	20,737	53
9 Of these senior civil servants and privately employed persons in leading positions	115	18	247	19	43	23	379	10	255	18	8,204	21
10 Civil servants at the lower positions and privately employed persons in other than leading positions	76	12	171	14	15	8	792	21	175	13	5,553	14
11 No particulars	165	27	258	20	7	4	666	17	256	18	6,980	18
12 Workers	66	11	51	4	8	4	277	7	87	6	2,186	5
13 Retired workers and employees	80	13	129	10	13	7	374	10	191	14	4,520	11
14 Occupation unknown	10	2	32	2	2	1	66	2	34	2	614	2
15 Total	620	100	1,278	100	186	100	3,810	100	1,400	100	39,457	100

Table 37

Development of the output of Austrian institutions of higher education by types of degree

1953-54 - 1963-64

Academic year	Doctorates		Types of degree: Diplomas in technology and in business and commerce		State examinations in law and political sciences		Qualifying examinations for secondary school teachers		Degrees in pharmacy		Translators' examinations		Diplomas and leaving certificates of arts colleges and academies	
	Total	A*	Total	A*	Total	A*	Total	A*	Total	A*	Total	A*	Total	A*
1953-54	1,829	1,592	881	836	480	479	225	225	97	94	52	47	276	226
54-55	1,573	1,360	853	805	352	352	201	201	130	125	50	47	259	226
55-56	1,360	1,100	874	812	311	310	174	174	109	104	57	57	253	205
56-57	1,384	1,059	897	814	395	395	119	119	76	73	68	57	234	170
57-58	1,365	1,023	871	798	286	284	146	146	82	76	60	52	248	178
58-59	1,250	943	820	728	323	323	140	140	81	71	87	73	277	191
59-60	1,358	919	853	761	345	345	148	148	94	83	91	72	295	210
1960-61	1,379	909	1,023	879	438	433	182	182	83	63	94	72	352	238
61-62	1,447	1,061	1,078	899	535	535	247	247	111	83	134	113	317	217
62-63	1,612	1,207	1,204	1,016	574	574	264	264	134	102	111	101	300	182
1963-64	1,746	1,352	1,264	1,065	673	673	357	357	128	98	117	103	349	230
Index numbers(a) (1953-54 = 100)														
1954-55	86	85	97	96	73	73	89	89	.	.	.	.	94	100
55-56	74	69	99	97	65	65	77	77	.	.	.	.	92	91
56-57	76	67	102	97	82	82	53	53	.	.	.	.	85	75
57-58	75	64	99	95	60	59	65	65	.	.	.	.	90	79
58-59	68	59	93	87	67	67	62	62	.	.	.	.	100	85
59-60	74	58	97	91	72	72	66	66	.	.	.	.	107	93
1960-61	75	57	116	105	91	90	81	81	.	.	.	.	128	105
61-62	79	67	122	108	111	112	110	110	.	.	.	.	115	96
62-63	88	76	137	122	120	120	117	117	.	.	.	.	109	81
1963-64	95	85	143	127	140	141	159	159	.	.	.	.	126	102

* A - Austrian Nationals

(a) No index numbers were calculated where the absolute numbers were below 100.

Table 38

Students receiving doctorates and diplomas in 1963/64

Absolute and relative numbers

	Austrians		Foreigners	
	Absolute	Percentages of total numbers of degrees	Absolute	Percentages of total numbers of degrees
Doctorates				
Theology	21	1	5	1
Law and political science	549	41	167	42
Medicine	258	19	103	26
Liberal arts	334	25	88	22
Technology	77	6	6	2
Mining	3	0	7	2
Agriculture	16	1	2	1
Veterinary medicine	22	2	5	1
Business and commerce	72	5	11	3
Total	1,352	100	394	100
Diplomas				
Economics	32	3	31	16
Interpreting	39	4	1	0
Engineering	603	56	131	66
Of these:				
(Technology)	(407)	(38)	(108)	(54)
(Mining)	(77)	(7)	(12)	(6)
(Agriculture)	(119)	(11)	(11)	(6)
Veterinary medicine	13	1	13	6
Business and commerce	378	36	23	12
Total	1,065	100	199	100

Table 39

Qualifying examinations for secondary school teachers in 1963/64

	Examination board							
	Vienna		Graz		Innsbruck		Total	
	Total	Of these female	Total	Of these female	Total	Of these female	Total	Of these female
Registered for the examination in the previous academic year	586	366	79	41	63	25	728	432
Registered for the examination in the current academic year	369	245	83	56	72	34	524	335
Total	955	611	162	97	135	59	1,252	767
Took the examination	434	273	88	48	59	25	581	346
Of these:								
Passed	251 (a)	155	63	36	43	17	357 (a)	208
Failed	183	118	25	12	16	8	224	138
Withdrawals from the examination	27	15	28	17	2	1	57	33
Still planning to take the examination . .	677	441	71	44	90	41	838	526

(a) Five of these were extension examinations

Table 40

Austrians holding doctorates or diplomas, by age

Absolute and relative numbers - 1964/65

Age (completed years of age)	Absolute numbers		Percentage breakdown by age group	
	Male	Female	Male	Female
Graduates holding doctor's degrees				
21	1	-	0	-
22	79	19	8	6
23	138	57	13	18
24	156	57	15	18
25	180	82	17	25
26	92	29	9	9
27	68	21	7	7
28	60	16	6	5
29	45	11	4	3
30 to 34	130	17	13	5
35 to 39	38	7	4	2
40 and over	42	7	4	2
Total	1,029	323	100	100
Graduates holding diplomas				
21	-	1	-	1
22	62	25	7	18
23	134	36	14	26
24	174	29	19	21
25	186	17	20	12
26	113	9	12	7
27	73	17	8	12
28	63	3	7	2
29	34	2	4	1
30 to 34	70	-	7	-
35 to 39	11	-	1	-
40 and over	6	-	1	-
Total	926	139	100	100

Table 41

Austrian university graduates by age, main field of study and type of degree - 1963-64

Absolute and relative numbers(a)

	Age (completed years of age)	Theology	Law and political science							Medicine		
		Doctorate	3rd state examination			Diploma in economics	Doctorate			Doctorate		
		Absolute	Absolute	Percentage		Absolute	Absolute	Percentage		Absolute	Percentage	
1	20	-	4	0.59	82	-	-	-	74	-	-	53
2	21	-	20	2.97		1	1	0.18		-	-	
3	22	-	178	26.45		4	88	16.03		-	-	
4	23	-	166	24.67		8	148	26.96		1	0.39	
5	24	2	107	15.90		7	99	18.03		38	14.73	
6	25	1	73	10.85		3	72	13.11		98	37.98	
7	26	2	37	5.50	13	-	35	6.38	15	35	13.57	35
8	27	3	20	2.97		1	17	3.10		25	9.69	
9	28	-	19	2.82		2	15	2.73		20	7.75	
10	29	1	13	1.93		-	14	2.55		11	4.26	
11	30 to 34	9	21	3.12	3	4	38	6.92	7	18	6.98	7
12	35 to 39	2	9	1.34	1	1	9	1.64	2	9	3.49	4
13	40 and over	1	6	0.89	1	1	13	2.37	2	3	1.16	1
14	Total	21	673	100.00	100	32	549	100.00	100	258	100.00	100

(a) Where the absolute numbers were below 100 no relative numbers were calculated.

Table 41 (cont.)

Austrian university graduates by age, main field of study and type of degree - 1963-64

Absolute and relative numbers

	Age (completed years of age)	Liberal Arts										
		Professional examination for academic translators			Inter-preters' diploma	Degree in pharmacy	Qualification to teach at secondary schools			Doctorate		
		Absolute	Percentage		Absolute	Absolute	Absolute	Percentage		Absolute	Percentage	
1	20	-	-	92	-	-	-	-	60	-	-	51
2	21	7	6.80		-	-	-	-		-	-	
3	22	12	11.65		3	4	1	0.28		10	2.99	
4	23	12	11.65		4	37	31	8.69		41	12.28	
5	24	343	33.01		3	32	95	26.61		58	17.37	
6	25	30	29.13		2	8	89	24.93		61	18.26	
7	26	3	2.91	5	6	4	39	10.93	25	32	9.58	27
8	27	1	0.97		14	4	26	7.28		23	6.89	
9	28	1	0.97		4	1	18	5.04		25	7.48	
10	29	-	-		1	2	8	2.24		10	2.99	
11	30 to 34	1	0.97	1	2	4	27	7.56	8	41	12.28	12
12	35 to 39	1	0.97	1	-	1	9	2.52	3	14	4.19	4
13	40 and over	1	0.97	1	-	1	14	3.92	4	19	5.69	6
	Total	103	100.00	100	39	98	357	100.00	100	334	100.00	100

Table 41 (cont.)

Austrian university graduates by age, main field of study and type of degree - 1963-64

Absolute and relative numbers

	Age (completed years of age)	Technology				Mining		Agriculture			
		Engineering diploma			Doctorate	Engineering diploma	Doctorate	Engineering diploma			Doctorate
		Absolute	Percentage		Absolute	Absolute	Absolute	Absolute	Percentage		Absolute
1	20	-	-	53	-	-	-	-	-	60	-
2	21	-	-		-	-	-	-	-		-
3	22	6	1.47		-	1	-	-	-		-
4	23	35	8.60		-	9	-	17	14.29		-
5	24	88	21.62		-	15	-	22	18.49		-
6	25	88	21.62		2	20	-	32	26.89		2
7	26	57	14.01	37	6	11	-	17	14.29	31	3
8	27	42	10.32		8	4	-	11	9.24		1
9	28	30	7.37		7	7	1	5	4.20		2
10	29	23	5.65		10	2	1	4	3.36		1
11	30 to 34	33	8.11	8	27	8	-	7	5.88	6	5
12	35 to 39	2	0.49	1	7	-	1	3	2.52	2	-
13	40 and over	3	0.77	1	10	-	-	1	0.84	1	2
	Total	407	100.00	100	77	77	3	119	100.00	100	16

Table 41 (cont.)

Austrian university graduates by age, main field of study and type of degree - 1963-64

Absolute and relative numbers

	Age (completed years of age)	Veterinary medicine		Business and commerce			
		Diploma (veterinary surgeon)	Doctorate	Diploma			Doctorate
		Absolute	Absolute	Absolute	Percentage		Absolute
1	20	-	-	-	-	76	-
2	21	-	-	-	-		-
3	22	-	-	73	19.31		-
4	23	2	2	95	25.13		3
5	24	4	3	64	16.93		13
6	25	2	4	56	14.82		22
7	26	1	1	30	7.94	19	7
8	27	-	2	18	4.76		10
9	28	-	-	18	4.76		6
10	29	-	3	6	1.59		5
11	30 to 34	2	6	14	3.70	4	3
12	35 to 39	2	-	3	0.79	1	3
13	40 and over	-	1	1	0.25	0	-
	Total	13	22	378	100.00	100	72

Annex to Chapter III

Appendix I

THE AUSTRIAN ECONOMY IN 1980

Population

The estimate of the population of active age is based on the assumption of exponentially declining mortality rates. For ages up to 10 the mortality experience of 1908-1961, for all other ages (except the highest where mortality was assumed constant) the mortality experience of 1951-61 was used to extrapolate the exponential decline. See graphs below.

Emigration and immigration are assumed to balance in the period considered.

The present estimate of the population of working age is higher than any of the two other available estimates, that of the Central Statistical Office and that of Professor K.H. Wolff (see: Beirat für Wirtschafts- und Sozialfragen: Vorausschätzung des österreichischen Arbeitskräftepotentials bis 1980, Vienna 1965). The population of age 15 to 75 according to the present estimates exceeds the higher of the alternative estimates (that of Professor Wolff) by 11,000 men and 11,000 women in 1980.

Manpower

The active population has been calculated on the basis of certain activity rates for the various age groups of the population. It was assumed that activity rates will change in future; in particular the participation of women, especially middle-aged women will increase, while on the other hand the participation of old people and of the young (because of increased school participation) will decline. The future activity rates are based on a mixture of extrapolation and rough and ready assumptions, which can be summed up as follows:

Unmarried women. For the ages 30 to 50 years the 1951/61 trend has been extrapolated. The resulting participation rate in 1980 (82 per cent) is still lower than that for men. For the ages 18 to 30 the participation rate has been left at the level of 1961 (88.4 per cent). An extrapolation would have led to an activity rate higher than it is for men. For the ages 14 to 18 we have reduced the rate from 60 per cent to 45 per cent to take account of the extension of the school age by one year, and of increasing numbers of girls going to school beyond the age of 15. For the ages above 60 the declining trend of activity has been extrapolated. For the age groups 50 to 60 the activity rate has been kept at the level of 1961, assuming a balance of the effects of earlier retirement and increased activity rates for the lower half of the age group.

Married women. We have left the activity rates for the 18-to 30-year-olds at the 1961 level, assuming that mothers with small children will work less often as the real incomes increase, and this will balance the rise in activity rates of child-less married women. The activity rate of the 30-to 50-year-olds has been assumed to rise above the level of the 18-to 30-year-olds, to about 54 per cent. These are rather conservative assumptions. An extrapolation of the 1951/61 trend would have meant very much higher activity rates in 1980. For the ages above 60 the declining trend 1951/61 has been extrapolated.

It has been assumed that the tendency to earlier marriage will continue. Correspondingly the strongly increasing trend in the proportion of married women in the age group 20 to 30 years has been extrapolated. For the remaining age groups the proportion of married women has been left unchanged at the level of 1961.

In spite of this increased participation rate of middle-aged women (compensated in part, it is true, by a drastic reduction in the higher age groups) the number of women at work in 1980 (1,379 thousand) will be only a little larger than in 1961, so that the proportion of women in the working force will be slightly smaller than it has been in recent years.

A very conspicuous change will occur in the age composition of the working population. The people at work at the ages of 30 to 50 will increase by 236,000, those between 18 and 30 by 54,000, while the older age groups will decline strongly, so that as a result the total working force in 1980 will be only 77,000 higher than in 1961.

The industrial distribution of manpower

The major change to be expected is the shift of manpower from agriculture into other sectors. It has been found from experience in other countries that the proportion of total manpower in agriculture is closely correlated with the gross national product per head of population.

The relation is as follows:

$$y = yo\,e^{-bx}$$

where y is the share of agriculture in total manpower and x is the gross national product per head of population. The two parameters yo and b have been estimated from a linear regression (see Graph VI below) on the basis of the values given in Table 42 below, and the following values have been obtained:

	yo	b
United States	94.9	0.00187
Netherlands	66.1	0.00055
Switzerland	54.8	0.00066
Austria	54.4	0.0000444

If the values of the national products are inflated to the prices of 1954 and transformed to 1954 dollar values by means of appropriate purchasing power parities (see Maizels, "Industrial Growth and World Trade", p. 546) the following standardised values are obtained for the parameter b:

United States	0.0011
Netherlands	0.00157
Switzerland	0.00111
Austria	0.000915

The fact that for two countries (the Netherlands and Switzerland) net instead of gross national product have been used impairs the comparison somewhat.

Table 42

Share of agriculture in total manpower in per cent

United States			Netherlands		
	Share of agriculture %	Gross domestic product per capita in $ at 1929 prices		Share of agriculture %	Net domestic product per capita in Dutch guilders at 1958 prices
1900	37.5	490	1899	29.6	1,506
1910	30.9	596	1909	27.3	1,593
1920	27.0	685	1920	22.9	1,767
1930	21.2	767	1930	20.1	2,260
1940	17.4	910	1947	19.4	2,202
1950	11.8	1,229	1956	12.4	2,955
1960	6.1	1,405	1960	11.1	3,274

Switzerland			Austria		
	Share of agriculture %	Net national product per capita in Swiss francs at 1910 prices		Share of agriculture %	Gross national product per capita in Austrian schillings at 1954 prices
1910	26.8	1,158	1934	37.1	8,549
1938	20.9	1,459	1951	32.2	11,884
1950	16.5	1,692	1961	22.6	19,743
1960	11.7	2,396			

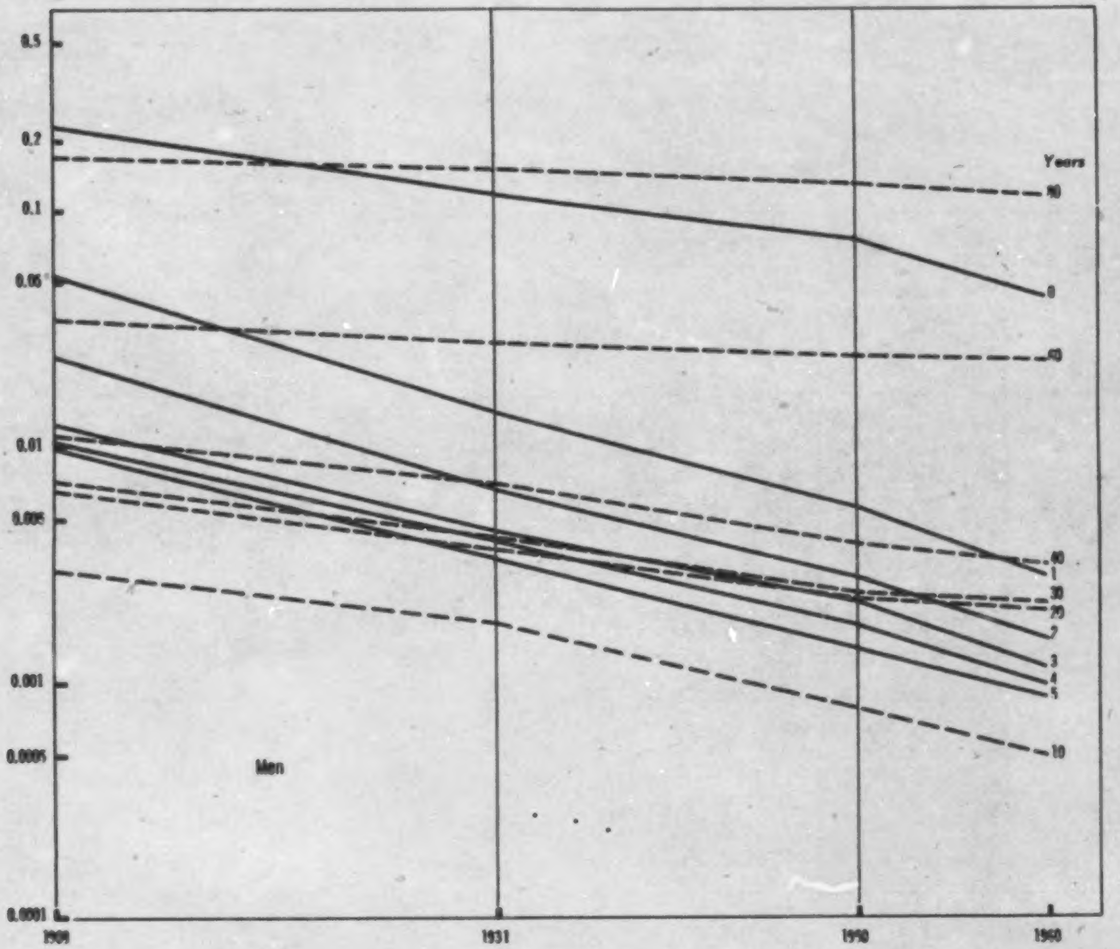
The equation for the United States which now runs

$$y = 94.9\ e^{-\ 0.0011\ x}$$

means that for each additional dollar of gross national product per head the share of agriculture in manpower declines by one per thousand. If gross national product per head increases,

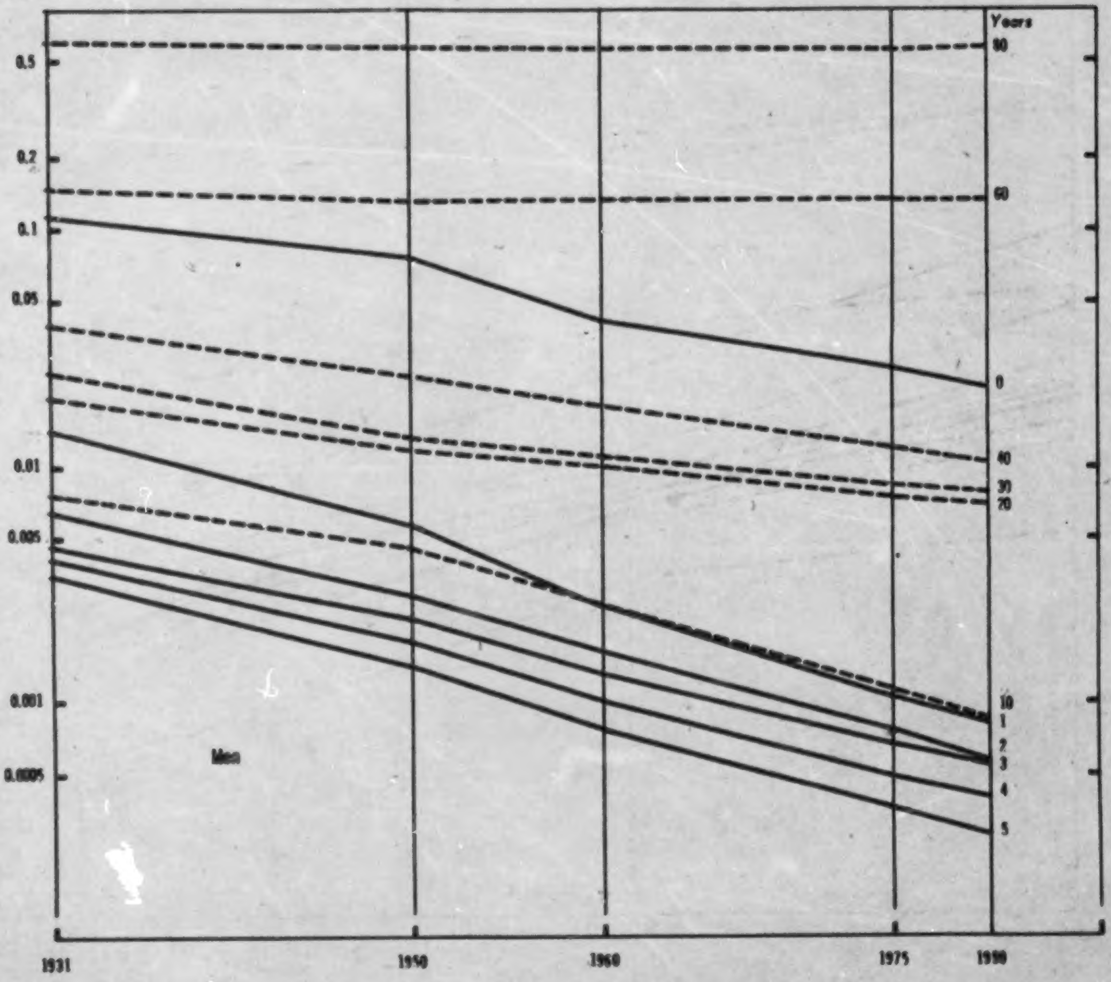
Graph II

MORTALITY AMONG MEN IN AUSTRIA 1908 TO 1960
(PROBABILITY THAT A MALE WHO IS EXACTLY 0, 1, 2, ... 80 YEARS OLD WILL NOT SURVIVE THE FOLLOWING YEAR)



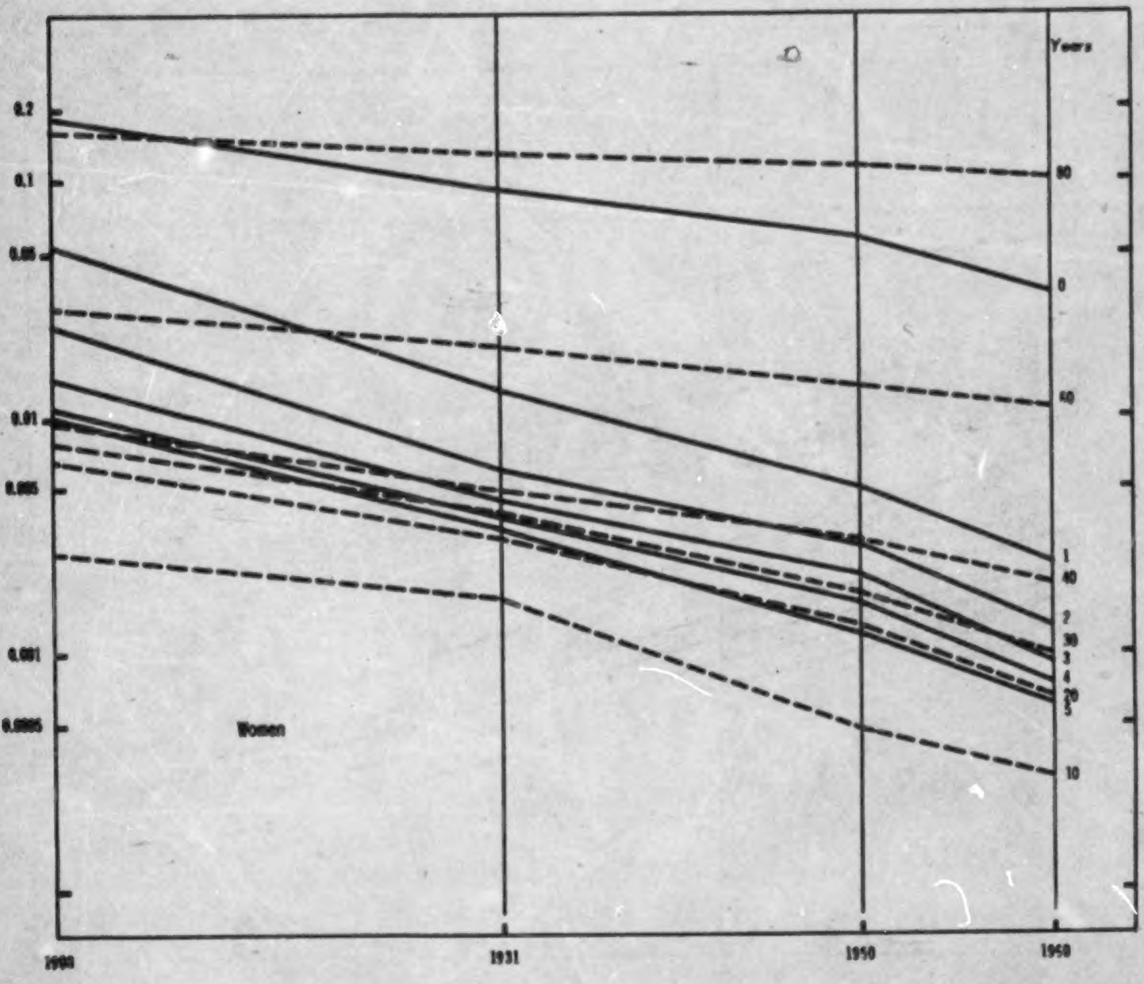
Graph III

PROJECTION OF MORTALITY AMONG MEN IN AUSTRIA, 1960 TO 1980
FOR AGES UP TO FIVE YEARS, ONE-YEAR MORTALITY PROBABILITY AS IN GRAPH II
FOR AGES ABOVE FIVE, PROBABILITY THAT A PERSON WHO IS EXACTLY 0, 1, 2, . . . 80 YEARS OLD
WILL NOT SURVIVE THE FOLLOWING FIVE YEARS



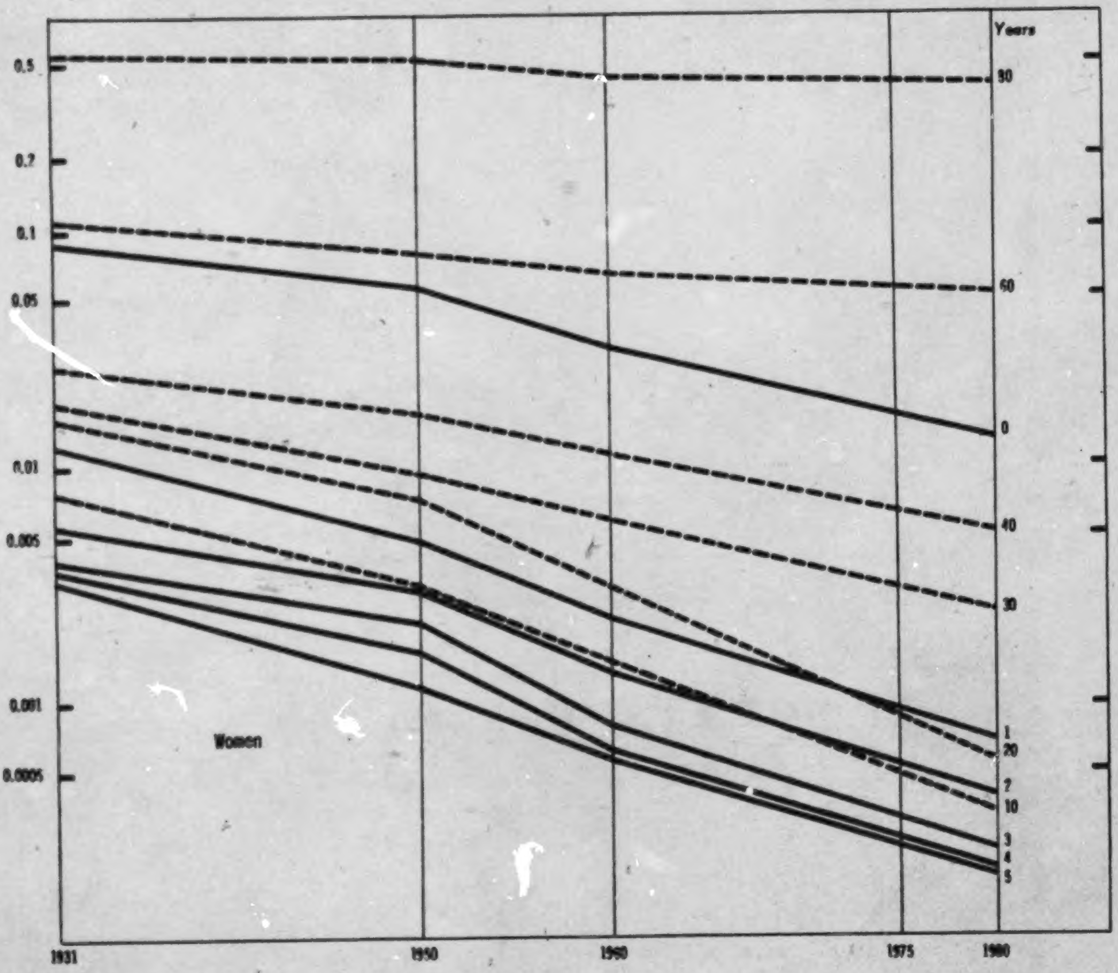
Graph IV

MORTALITY AMONG WOMEN IN AUSTRIA 1908 TO 1960
(PROBABILITY THAT A FEMALE WHO IS EXACTLY 0, 1, 2, . . . 80 YEARS OLD WILL NOT SURVIVE THE FOLLOWING YEAR)



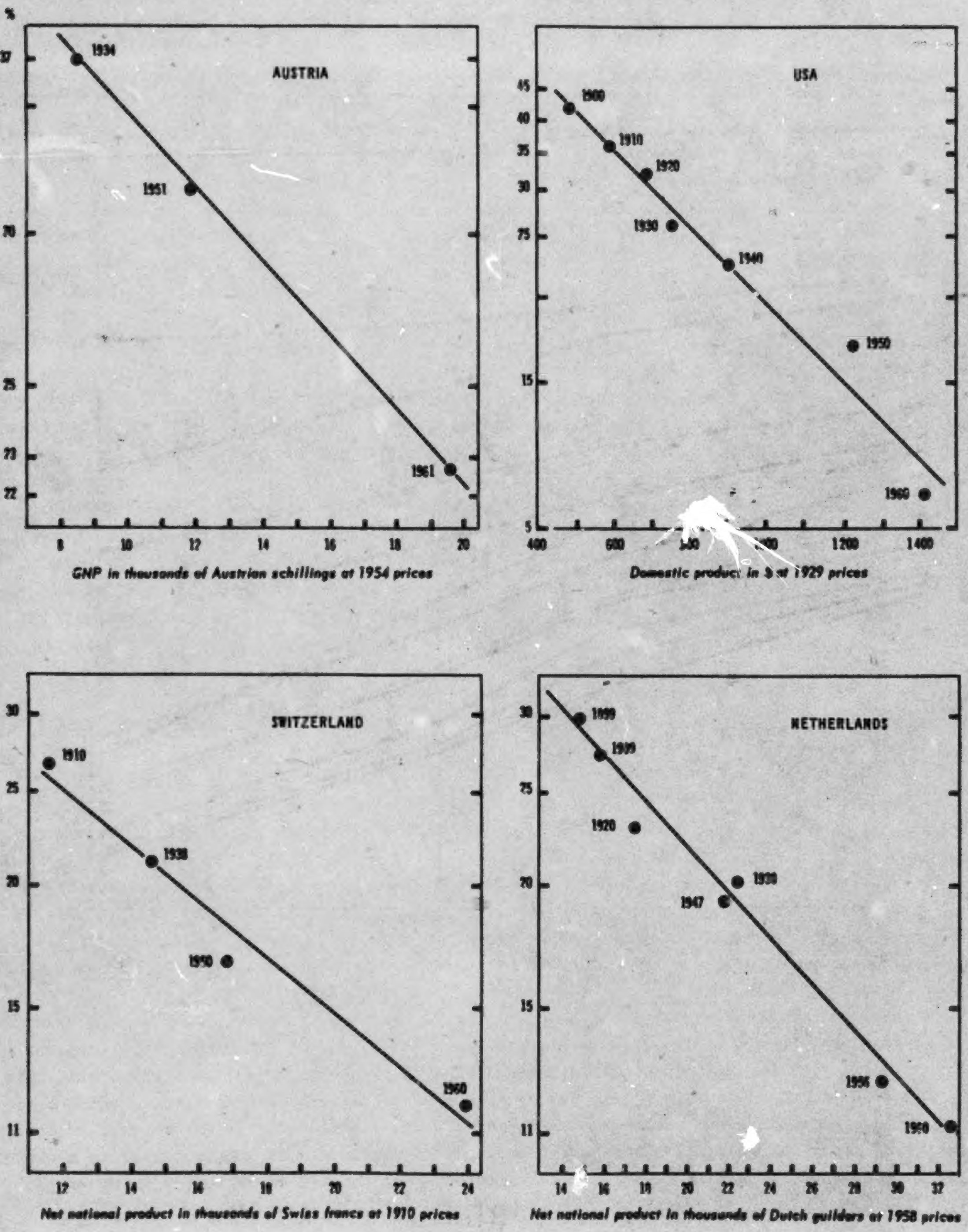
Graph V

PROJECTION OF MORTALITY AMONG WOMEN IN AUSTRIA, 1960 TO 1980
FOR AGES UP TO FIVE YEARS, ONE-YEAR MORTALITY PROBABILITY AS IN GRAPH IV
FOR AGES ABOVE FIVE, PROBABILITY THAT A PERSON WHO IS EXACTLY 0, 1, 2, . . . 80 YEARS OLD
WILL NOT SURVIVE THE FOLLOWING FIVE YEARS



Graph VI

SHARE OF AGRICULTURE IN TOTAL MANPOWER AS A FUNCTION OF NATIONAL PRODUCT PER HEAD IN VARIOUS COUNTRIES



say by $28 per annum, that will imply a decrease of 3 per cent per annum in the share of agriculture in manpower.

The estimate for Austria rests on three observations only (1934, 1951 and 1961), but the regularity of the development in other countries offers a certain additional support for the extrapolation of these data. As long as detailed investigations of this problem have not been made in Austria, one has, for better or worse, to contend with global estimates. We have therefore extrapolated the equation based on the Austrian data in order to estimate the share of agriculture in manpower for the years up to 1980.

This implies that we assume the shift out of agriculture to continue in the future but at a somewhat slower pace than in the early 50's, because the growth rate of gross national product assumed for the future is less than in the early 50's.

The future gross national product is given as a target value (4 per cent annual growth per occupied person together with the expected amount of total manpower gives gross national product in 1980).

The share of major sectors in total manpower is determined as follows: we deduct from the estimated active population military personnel (about 10,000), the unemployed (assumed to remain constant at the 1961 level) and the non-allocatable manpower. Then the agricultural manpower is deducted. The proportion of the major sectors in the remaining non-agricultural manpower is regarded as a linear function of gross national product (at constant prices) per head of population; the projection of this relation into the future is based on the experience of 1951-61. Thus, as in the case of agricultural manpower, the pace of future change is assumed to be less rapid than in the 1950's. The principle of extrapolation has been modified in the following cases: the share of finance has been assumed to remain constant at the 1961 level, because automation may be expected to save a great deal of manpower in this sector. The share of trade has been assumed to increase only half as much as it did in 1951-61, in relation to the increase in gross national product. The rationalisation in trade had not proceeded very far up to 1961, but it will progress rapidly in future owing to scarcity of labour. Finally, the decrease in domestic service will proceed less quickly, according to our assumptions, than in the past.

Gross national product

The growth of 4 per cent of gross national product per occupied person is assumed as a target. It corresponds to the actual rate of growth of gross national product in relation to manpower in the period 1958 to 1963.

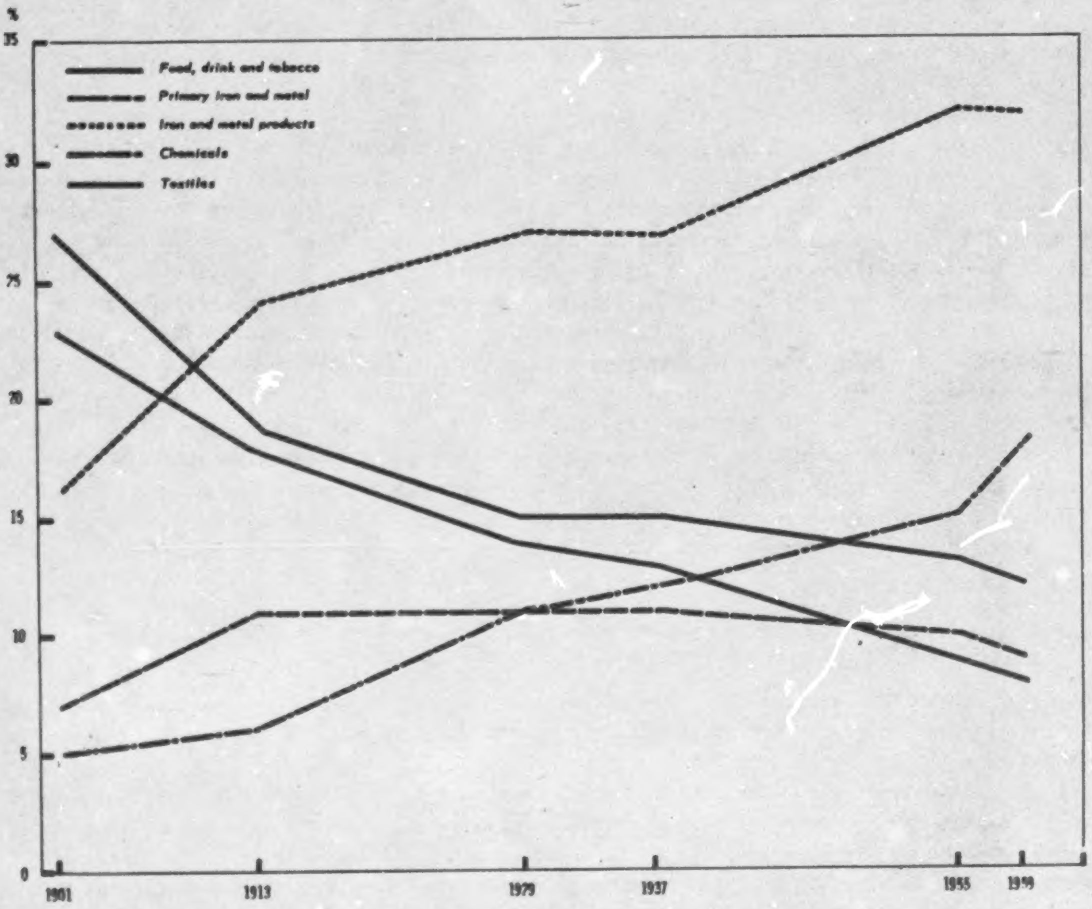
The estimate of gross national product in various sectors is based on an extrapolation of the growth rate of productivity in 1958-63, which has been modified, however, in several cases, such as in the case of agriculture where a more rapid increase in productivity has been assumed. As a result of this modified extrapolation an average increase in gross national product per man of 4.2 per cent for the period 1961 to 1980 is obtained. The excess of this productivity increase over and above the target of 4 per cent might be absorbed by a reduction of working hours per man. It is assumed that working hours will not be reduced more unless the reduction can be compensated for by an increase in productivity per hour which will make it possible to reach the target of 4 per cent increase in gross national product per man.

A special calculation has been made concerning the distribution of value added in manufacturing among different industries. The growth of productivity in manufacturing as a whole has been assumed to be 4 per cent. The calculation shows how the distribution among various manufacturing industries of the total value added will develop if it follows the tendencies which were observed in the European OECD countries in general in the past decades.

The industrial distribution of the value added in manufacturing is given in Appendix IV, Table 48, for the European OECD countries. The percentage share of various industries in the total manufacturing has been regarded as a function of time(1) and regression lines have been calculated for each industry group. These are shown in Graph VII below:

Graph VII

SHARES OF VARIOUS INDUSTRIES IN TOTAL VALUE ADDED IN MANUFACTURING IN THE EUROPEAN OECD COUNTRIES 1900 TO 1960



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(1) It would have been consistent to regard the share of various industries in the total value added of manufacturing as a function of gross national product per head and not of time, because we have also treated the changes in the manpower structure in this way. Since the present and anticipated growth of gross national product per head in Austria is several times as high as it was in Western Europe from 1899 to 1957, we should obtain greater changes in the shares of manufacturing industries and, as a consequence, a structure which in 1980 would greatly differ from the present Western European structure. A reluctance to extend the extrapolation over such a wide range of values decided us against this method.

The regression coefficients for the European OECD countries have been applied to the share of the various industries in Austrian manufacturing. The resulting calculations are shown in Appendix IV, Table 49. Our estimate brings the share of metal products in 1980 up to 34 per cent compared with 32 per cent in the OECD countries in 1959 and the share of chemicals in 1980 to less than 15 per cent as compared with 18 per cent in the OECD countries in 1959. Our projection would therefore result in a structure of manufacturing similar to that which obtains in the European OECD countries at present. The only exception is the share of textiles, which is probably too low according to our calculation.

This future structure of manufacturing in Austria is to be regarded as a target or as a conditional projection: it can materialise only through a conscious effort to change the existing proportions, but the resulting structure will be adapted to the requirements of world trade.

Appendix II

THE WASTAGE OF MANPOWER

Wastage rates for skilled workers

The following method has been used to obtain wastage rates for various kinds of skilled workers. The change in the stock of trained manpower as given in the population census of 1951 and that of 1961 has been compared with the number of people trained in the period between. The difference corresponds to the wastage of manpower, that is, to the amount which has to be replaced annually by newly-trained people just to keep the stock of manpower unchanged. This wastage can be expressed as a percentage of the geometric average of the stock of workers in 1951 and 1961. The results are given in Appendix IV, Table 56, for various skilled trades. In many cases the annual wastage rate is between 3 and 4 per cent, which is a rather plausible figure if account is taken of the incidence of incapacity and of the occasional change to white collar worker status which may lead to a comparatively high wastage rate of 4 per cent. This rate is obtained for example, in the case of metal fitters and tool makers and in the case of watchmakers, metal printers, etc. For turners the rate is 3.5 per cent. As would be expected, the trades in which women predominate, such as for example millinery, have a high wastage rate, and where the proportion of women is considerable, as for example in the case of tailors (wastage 7.8 per cent), hairdressers (wastage 5 per cent), the wastage rate is also considerable. As will be shown presently, however, these high wastage rates are not only influenced by the participation of women but much more by shrinkage in the trades concerned; only for hairdressers is this not the case, the high wastage rate here being due exclusively to the participation of women.

In several cases the percentage wastage rates given in Appendix IV, Table 56, are surprisingly high or very low. Some consideration of the data shows that this is connected with the growth or shrinkage of the trade in question. Dying or strongly shrinking trades have quite naturally an abnormally high percentage of old people and therefore wastage is very high. This is true, for example, for blacksmiths (wastage rate 7.4 per cent, shrinkage rate 3.4 per cent), for cabinet makers (wastage rate 5.6 per cent, shrinkage 0.8 per cent), for trained sawmill workers (wastage rate 6.6 per cent, shrinkage rate 5.4 per cent) for casket makers (wastage rate 10.7 per cent, shrinkage rate 8.1 per cent). The high wastage rate for tailors of 7.8 per cent already quoted above is also connected with a shrinkage which is 2.7 per cent in this case. Also for millinery, where wastage is 9 per cent, the shrinkage rate of 5.5 per cent is similarly important. Another declining trade is that of the shoemaker with a wastage rate of 4.5 per cent and a shrinkage rate of 2.6 per cent, and the miller with a wastage rate of 8.3 per cent and a shrinkage rate of 5.1 per cent. On the other hand, fast growing trades may quite naturally have a low wastage rate: the electricians' trade, which expanded by 2.4 per cent per annum, has an estimated wastage of only 2.1 per cent. Mechanics with an expansion of 2.2 per cent per year have a wastage rate of 3.1 per cent.

The difference in wastage rates between different trades is thus strongly influenced by age composition which in turn is influenced by growth or shrinkage of the trade in question. Generally speaking a great percentage expansion of demand will be associated with a low wastage rate.

A note on the technical difficulties and defects of the above calculations may be added here because it is connected with certain more fundamental considerations. The number of skilled workers trained in the period considered has been identified with the number of apprentices who have passed their final examination. This is not always a proper estimate because in certain cases, for example in the case of house-painters, many skilled workers never pass an examination and are nevertheless accepted as skilled workers by their employers. The question of the identification of a skilled worker in the population census is more important. The census does not say whether a worker is skilled or not, it only gives his trade and we have to guess from the description of his trade whether he is a skilled worker or not. In the period concerned, however, a process has been going on of undermining the skilled character of certain trades to such an extent that training is not needed anymore for such a trade; a typical example is weaving which used to be a highly skilled trade and is not so any longer. At the same time, weavers are still being trained, partly with a view to having a reserve from which to choose foremen, (Webmeister), and the weavers trained in the past still work at their trade.

On the other hand, a considerable number of skilled workers have never taken an examination, but are upgraded in the plant on the basis of their practical experience.

For these reasons the wastage rates calculated by the above method are not a reliable guide.

Wastage by age groups

Age composition is a major factor in the determination of wastage. Now the age composition of the Austrian labour force generally is expected to undergo very marked changes from 1961 to 1975 and 1980. It is therefore of great importance to obtain data for wastage at various ages. By analogy with mortality tables which show the probability of death, these data will indicate the probability of exit from the active population at various ages. Applied to a specific age composition, for example that of the active population of Austria in 1980, these exit probabilities will yield the overall wastage rate per annum. Pursuing this approach, we get much more information on the problem of wastage than we should have without considering age groups. On the other hand, the approach has obvious limitations. We cannot easily go beyond very broad manpower categories, not only for reasons of non-availability of data, but for more general reasons: the samples will be too small to be of any help if we analyse individual professions or trades. The following analysis is broken down only into manual workers and white collar workers, men and women. Therefore, we do not take account of the peculiarities of different occupations except in so far as they are themselves only a consequence of different age composition.

To obtain an estimate of the age-specific exit probabilities, two kinds of approach have been used:

Approach A

This estimate embodies only the most important causes of exit, namely death, invalidity and retirement on account of age. These are not the only reasons for exit from the labour force. Among the others we should mention: transfer to other occupations (from employees to employers or from manual workers to non-manual workers), emigration, withdrawal for family reasons (in the case of women). These cases are not covered by the present approach "A", which is therefore inadequate, especially for women, though less so for men.

The basic data are drawn from the social security statistics, which give the mortality of employed persons by age. This differs very much from the general mortality as given in the mortality tables for the Austrian population as a whole. These general mortality tables can on no account be used for the active population, which has a much lower mortality than the general population. The probability of withdrawal from the labour force on account of incapacity or age has also been calculated for various age groups from social security data. Unfortunately the estimates are available only for one year - 1960.

Approach B

For this method we again use social security data, namely the number of employed persons according to their year of birth. We compare the number of persons of a given birth cohort employed in two successive years. In the ideal case, when the movement at a given age is all in one direction, the comparison lets us know the numbers entering or the numbers leaving the employed labour force, as the case may be.

This method will take account in principle of the cases not covered by approach "A". However, it is inadequate in so far as there are entries and exits at the same time, especially in the case of women, and we can ascertain only the balance of the two. At the age of 20 to 25 for example, there are exits of women from the labour force on account of marriage or child birth, while at the same time other women, for example graduates, enter the labour force for the first time. Again, at a later age, women who did not previously work, enter the labour force on account of household duties or illness. As far as the entries and exits of women in middle age are concerned, we might take the view that it is only the balance which interests us, provided that what we want to know is really the net wastage of women which has to be replaced by young women. The balancing of entries and exits in the case of women in their early twenties, on the other hand, will affect the picture seriously and will lead to an underestimate of the wastage in the years concerned.

It would be of the greatest importance not only from the point of view of an estimate of wastage rates, but in view of the general economic and sociological interest of the question, to get a clear picture of the movement of women into and out of the labour force at various ages. More information on this question might be obtained by an analysis of the declarations sent in by employers to the health insurance authorities whenever an employee enters or leaves employment. A statistical analysis of these declarations would have to cover the whole of Austria and all social security institutes.

For the reasons mentioned above, the wastage rate estimated by the present method cannot be very satisfactory in the case of women. There is, however, a deeper reason why the data cannot give us full information. We have these data only for the last few years, and these years apparently were exceptional in so far as a considerable number of middle-aged women entered employment who had not found it possible to do so before; and this very often overcompensated the wastage in the middle-age groups, so that according to the present method it appears that for certain ages there is, as it were, a negative wastage on account of these newly entering women. In other words, homogeneity in time does not obtain and therefore the estimate of wastage for various age groups is not correct. We are apparently in a period of transition with regard to the propensities of women to enter or leave employment, and it is very difficult to predict what the future course of events will be. It is all the more imperative to get all the information we can on the current situation.

The data relating to approach "A" and approach "B" are given in Appendix IV, Table 57, and in summary form in Table 58 of the same appendix.

Approach "A" gives age-specific exit rates which are lower for non-manual than for manual workers. The difference in the rates between men and women is mainly accounted for by the earlier retirement of the latter. Applied to the age composition of 1961, these data yield a wastage rate of 2.7 per cent for men, and 2.9 per cent for women in the case of manual workers. The wastage for non-manual workers is 2.2 per cent for men, and 1.7 per cent for women. The very low rates for women are the result of their age composition: 12.3 per cent of the female non-manual workers were over 50 years of age, as compared with 27.7 per cent in the case of the men (1961). If the age-specific wastage rates for females are applied to the age composition of men we obtain a (fictitious) wastage rate of 4.8 per cent; in other words, if the age composition of women had been the same as for men, the wastage rate would have been 4.8 per cent. This, incidentally, illustrates the formidable influence which an abnormal age composition can have on the wastage rates.

How can the abnormal age composition of female employees be explained? It might be due to an increase in the female participation rate which has taken place over a very long time. The age groups near retirement are from a generation in which female participation was lower than it is now or when women retired early and did not return. The young age groups on the contrary have a high participation rate and, moreover, the middle-aged women have been participating more strongly in the labour force recently than they did before.

We now turn to approach"B" and we consider the global wastage rates which result if we apply the age-specific wastage rates to the age composition in 1961. We find that in the case of men the wastage rates are very much greater for manual workers than for non-manual workers: 3.9 per cent against 2.5 per cent for the average of the years 1961 to 1965. The higher wastage for manual workers is probably due largely to the transition from manual to non-manual or self-employed work. To some extent emigration may also play a role in the lower age groups. The wastage rates for non-manual workers are correspondingly small, because some wastage is compensated for by the inflow of manual workers.

The data for men are also affected by the possibility, offered by a recent law, of obtaining the old age pension at the age of 60 instead of 65 (or 55 instead of 60 in the case of women), if certain conditions are fulfilled (minimum number of years worked). While these conditions are rarely fulfilled in the case of women, they more often are in the case of men, and the greater part of the total shift to earlier pensioning has probably occurred in the years 1961 to 1965, so that the number of men who left the labour force in these years was higher than usual.

Another factor affecting the apparent wastage are the entries to permanent government service (federal, provincial, or municipal); this again is of less importance for women than for men. Our data do not include the people in permanent government service because they are not classified according to age. For this reason the entries to permanent government service are included in our calculation as wastage, which for this reason is overestimated.

The overall wastage for female manual workers was 4.2 per cent for the average of the years 1961/62 to 1964/65. Although this ratio seems low in comparison to that for men, it is not implausible because the transition to higher social status probably does not play a very large role in the case of women. The corresponding wastage rates for female non-manual workers are 4.4 per cent in 1961/62 and 2.5 per cent in 1962/63. It will be noted that here the age composition plays the same role as in the case of approach "A" (see above). This would not explain the large difference between the two years and it is obvious that the lack of homogeneity of the data in time plays a very large role. In other words, it would seem that in the last few years the influx of middle-aged women into employment has been exceptionally great, so that the wastage was correspondingly low.

The exit rates for women (non-manual) are especially great in their twenties: in the age groups 20 to 24, 4.3 per cent for the average of the years 1961/62 to 1964/65 left employment each year; in the age group 25 to 29, 4.4 per cent. These exits, almost entirely due to marriage or child care, are understated, because the data give only the balance of exits and entries.

Evidently the question of wastage in the case of women is far from being satisfactorily answered. More data, and especially data over a longer series of years, are required.

Wastage rates for medical doctors

Medicine is the only large profession which keeps a register of its members. The Austrian Chamber of Physicians and its officers have kindly given access to the register so that an age composition of doctors could be compiled. Data on the wastage in the years 1961 to 1964 were also provided so that age-specific wastage rates could be obtained.

The overall wastage in the last four years was 2.0 to 2.2 per cent of the stock, or 260 to 285 doctors a year, of whom between 33 and 49 a year were lost by emigration. Owing to the inclusion of emigration in the wastage, the age-specific wastage rates are high for the young ages up to 30. The wastage of 3.5 per cent in the age group 25-29 is mainly due to emigration. The low overall wastage of 2 per cent is explained by a relatively favourable age composition of doctors.

The age-specific wastage rates are used to calculate the wastage arising from the stock of doctors in existence in 1961. This wastage will be 316 doctors a year in the period 1975-79.

Since we do not possess wastage data by age for other graduates, we have applied the data for doctors to the graduate population as a whole (the distribution of the stock of graduates by age can be approximately estimated, because for a number of professions, such as engineers, lawyers, teachers, etc., it is known). This is no doubt unsatisfactory, because the retirement habits, etc., will not be the same for other graduates as for medical doctors. This disadvantage is perhaps less important than the advantage of being able to take account of the age composition, which is only possible by using age-specific wastage rates.

The following table shows the wastage for doctors, fully qualified dentists, less-qualified dentists, and university graduates generally. The age-specific wastage rates which have been ascertained from the data for doctors have been applied to the case of dentists as well as to all graduates.

Table 43

Wastage per year

	1965-69	1970-74	1975-79
Wastage from the 1961 stock			
Doctors (including fully qualified dentists)	285	286	315
Fully qualified dentists	31	33	35
Less-qualified dentists	86	85	82
University graduates (excluding teachers)	1,800	1,780	1,789
Wastage from the additions to the stock after 1961			
All university graduates (excluding teachers)	302	514	616

In calculating the replacement demand for all graduates, account has been taken not only of the wastage from the 1961 stock, but also of wastage from the new accruals after 1961. The wastage in the lower age groups is not inconsiderable; this is due to the fact that the larger parts of emigration is accounted for by these age groups (especially those below 30). Roughly speaking, we can identify the wastage from the additions after 1961 with emigration. The implicit assumption that emigration will be as large for graduates as a whole as it has recently been for doctors is a moderate assumption avoiding the extremes of optimism and pessimism.

Appendix III

SOME REMARKS ON METHODS OF ESTIMATING REQUIREMENTS

In the present study no use has been made of methods based on the Leontief-matrix. One reason for this is that we do not yet have an input-output matrix in Austria and another is that there are no targets for the production of individual industries set by a general economic plan.

There is still another reason. The Leontief methods will be particularly appropriate if the input coefficients in the various industries (in the present case, number of engineers, etc., required for a given volume of output) are given - perhaps as a function of time - and the estimated requirements depend chiefly on the relative output of the various industries; in other words, if the industrial structure is the decisive consideration for the resulting requirements.

We have to consider, however, that in Austria the individual industries, in so far as they can be statistically separated, are very heterogeneous with regard to occupational structure, and even the individual enterprises are heterogeneous: they combine types of output which require large numbers of highly skilled specialists with other types which require in practice scarcely any specialists at all. Production would have to be classified so as to make it homogeneous with regard to the skilled manpower requirements: we should thus have to separate the production of heavy transformers from the task of working out an automatic regulation for a hydro-electric plant. We should even have to distinguish between new products or new types of products, with their high skill requirements, and routine production (such as, for example, of ordinary wireless sets). Since our statistical data are altogether insufficient for that purpose (and in this respect our situation is different from that of other countries only in degree), we are not able to measure statistically those changes in output which are relevant to the skill requirements. To be concrete, the changes in the structure of Austrian manufactures in favour of "brain-intensive" industries which we assume for the period 1961-1980 will to a great extent occur within one and the same industry, even within one and the same firm or plant.

The Leontief methods will not help us very much as long as the task of subdividing the output and imputing skilled manpower to particular products surpasses our statistical capacity. As a consequence the weight of the problem, from a practical point of view, is shifted to a large extent from the industrial structure to the occupational structure, which becomes the sensitive point of the whole procedure. The decisive changes will occur in the density of engineers (to give one example) in individual industries and even in individual firms, which will increase as a consequence of a particular shift in the production programme. The requirements estimate will depend in the first instance on what development of densities of engineers one anticipates.

One is tempted to treat these matters in the same way as all those cases where "standards" of manpower requirements are assumed, such as, for example, the number of doctors per 10,000 inhabitants or the number of pupils per teacher. In a word, one selects a density of engineers which appears adequate with a view to a desired economic development. In judging what is adequate, one may, for example, use foreign experience.

In studies of manpower requirements it is often stated that the most critical point of the estimate is the "educational content" of an occupation. The educational content must in many cases be based on a standard which is regarded as desirable or which constitutes a condition for achieving a satisfactory development.

But, according to the above arguments, the sensitive point of the estimating procedure already occurs, at least under Austrian conditions, in the choice of occupational densities, for example the densities of engineers. Moreover, in those cases where the occupation is defined by reference to education, the educational content ceases to be a separate problem.

A further word on the meaning of extrapolation of data in the field of manpower requirements. It is clear that the observed data never tell us anything at all directly about the development of requirements or demand: they only give us a measure of supply, of the degree to which the economy is endowed with skilled manpower. What we observe is the stock of engineers, for example, and its increment over time. That tells us only that so many engineers have been trained and have remained in the country or have come in from outside. We can only, indirectly, draw conclusions with regard to requirements by comparing the extent of: a) unemployment, b) misuse of skill (use in occupations for which the training in question is not necessary) and c) unsatisfied demand for the skill in question, at the beginning and at the end of the period. The last two of the factors mentioned are clearly not easy to judge quantitatively. Nevertheless, it is necessary to form a judgment on the extent of these factors if one wants to interpret the empirical data with a view to the development of manpower requirements.

Appendix IV

The following tables, to which frequent reference is made in the body of Chapter III, provide the basic supporting data for the argument presented therein:

Table 44

Population (A) and economically active population (B)

Age	1961		1965		1970		1975		1980	
	A	B	A	B	A	B	A	B	A	B
Men										
from - to less than										
14 " " " 15	54	20	49	18	52	-	62	-	67	-
15 " " " 18	146	113	160	124	146	108	175	117	196	118
18 " " " 30	589	538	613	556	644	580	595	532	644	572
30 " " " 50	780	760	773	752	858	835	936	912	959	934
50 " " " 60	450	407	420	380	320	290	312	282	389	354
60 " " " 65	186	123	201	130	191	120	174	106	107	63
65 " " " 70	132	31	150	31	170	31	162	26	147	21
70 " " " 75	96	20	98	15	115	12	130	9	124	6
14 " " " 75	2,433	2,012	2,464	2,006	2,496	1,976	2,546	1,984	2,633	2,068
All ages	3,296	2,012	3,378	2,006	3,493	1,976	3,611	1,984	3,738	2,068
Women										
from - to less than										
14 " " " 15	51	16	47	15	50	-	59	-	65	-
15 " " " 18	142	99	153	112	141	103	168	112	191	114
18 " " " 30	566	401	590	413	616	426	578	395	625	421
30 " " " 50	968	518	912	503	947	542	944	561	944	580
50 " " " 60	548	240	541	237	438	192	445	195	502	220
60 " " " 65	241	48	252	45	258	40	252	35	165	20
65 " " " 70	199	22	217	22	234	22	242	20	238	17
70 " " " 75	153	16	164	13	187	11	203	8	211	6
14 " " " 75	2,868	1,360	2,876	1,360	2,871	1,336	2,891	1,326	2,941	1,378
All ages	3,777	1,360	3,855	1,360	3,961	1,336	4,061	1,326	4,160	1,378
Men and women										
from - to less than										
14 " " " 75	5,301	3,372	5,340	3,366	5,367	3,312	5,437	3,310	5,574	3,446
All ages	7,073	3,372	7,233	3,366	7,454	3,312	7,671	3,310	7,898	3,446

Table 45

Activity rates

Age	1951	1961	1965	1970	1975	1980
Men						
14 to less than 15	72.8	37.4	37.4	0	0	0
15 " " " 18		77.0	77.0	74.0	67.0	60.0
18 " " " 30	94.1	91.3	90.8	90.1	89.4	88.8
30 " " " 50	97.1	97.4	97.4	97.4	97.4	97.4
50 " " " 60	89.4	90.5	90.5	90.5	90.6	91.0
60 " " " 65	69.9	66.0	64.5	62.6	60.9	59.1
65 " " " 70	43.6	23.2	20.9	18.3	16.0	14.0
70 " " " 75	45.6	21.1	15.5	10.5	7.2	4.9
Married women						
18 to less than 30	37.8	50.5	50.5	50.5	50.5	50.5
30 " " " 50	34.3	46.2	47.9	50.1	52.3	54.5
50 " " " 60	32.0	38.2	38.2	38.2	38.2	38.2
60 " " " 65	24.4	20.5	19.1	17.5	16.1	14.7
Non-married women						
18 to less than 30	85.1	88.4	88.4	88.4	88.4	88.4
30 " " " 50	71.7	75.2	76.7	78.5	80.4	82.3
50 " " " 60	53.1	53.0	53.0	53.0	53.0	53.0
60 " " " 65	27.5	18.9	16.3	13.5	11.2	9.3
All women						
14 to less than 15	60.4	31.3	31.3	0	0	0
15 " " " 18		69.9	73.0	73.0	67.0	60.0
18 " " " 30	65.4	87.0	70.1	69.2	68.2	67.3
30 " " " 50	45.4	53.5	55.2	57.3	59.4	61.5
50 " " " 60	39.8	43.8	43.7	43.7	43.7	43.7
60 " " " 65	25.9	19.7	17.7	15.6	13.7	12.1
65 " " " 70	19.1	11.3	10.3	9.2	8.2	7.3
70 " " " 75	19.5	10.3	7.9	5.7	4.1	3.0

Table 46

Projection of the industrial distribution of manpower in Austria(1) by sector

in 1,000

	1951		1961		1965		1970		1975		1980	
	N	%	N	%	N	%	N	%	N	%	N	%
Active population(2)	3,347	100.0	3,360	100.0	3,358	100.0	3,301	100.0	3,300	100.0	3,437	100.0
Unemployed	77	2.3	63	1.9	63	1.9	62	1.9	62	1.9	65	1.9
Not allocatable	27	0.8	18	0.5	17	0.5	17	0.5	17	0.5	18	0.5
Agriculture and forestry	1,078	32.2	760	22.6	669	19.9	557	16.9	447	13.5	336	9.8
Manufacturing and handicrafts . .	948	28.3	1,080	32.1	1,115	33.2	1,133	34.3	1,173	35.5	1,266	36.8
of which:												
Manufacturing	545	16.2	665	19.8	699	20.8	725	22.0	767	23.2	851	24.7
Handicrafts and small business .	403	12.1	415	12.3	416	12.4	408	12.4	406	12.3	415	12.1
Construction	235	7.0	247	7.3	248	7.4	246	7.5	246	7.5	255	7.4
Electricity, gas, water	26	0.8	32	1.0	34	1.0	35	1.1	38	1.2	42	1.2
Transport and communications . . .	172	5.1	195(1)	5.8	201	6.0	205	6.2	212	6.4	228	6.6
Trade	229	6.8	309	9.2	326	9.7	340	10.3	361	10.9	404	11.8
Finance, insurance	26	0.8	40	1.2	41	1.2	42	1.3	44	1.3	48	1.4
Government	146	4.3	174(1)	5.2	182	5.4	187	5.7	197	6.0	216	6.3
Domestic service	74	2.2	46	1.4	40	1.2	34	1.0	29	0.9	24	0.7
Other services	309	9.2	396	11.8	422	12.6	443	13.4	475	14.4	535	15.6

(1) According to the Classification of the Population Census.

(2) Excluding military personnel.

Table 47

Projections of gross national product in Austria (at factor cost, in prices of 1954)

GNP in billions of Schillings - Manpower in thousands - GNP per man in thousands of Schillings

	1961			1965			1970			1975			1980			Compound rate of growth 1961-1980 1 - 1980	
	GNP	Manpower	GNP per man	GNP	Man-power	GNP per man	GNP	Man-power	GNP per man	GNP	Man-power	GNP per man	GNP	Man-power	GNP per man	of GNP	of GNP per man
Agriculture	16.5	764.7	21.6	18	675	27	20	561	35	21	451	47	21	339	61	1.3	5.5
Manufacturing	40.6	665.4	61.0	50	696	72	63	719	87	81	763	107	109	834	130	5.2	4.0
Handicrafts	12.4	407.0	30.4	13	408	33	14	400	36	16	398	39	18	413	43	1.9	1.9
Construction	9.4	223.9	42.1	11	226	49	13	224	60	17	225	74	21	236	90	4.3	4.0
Electricity, gas, water	4.1	24.2	171.3	5	26	210	8	28	279	11	31	360	16	35	451	7.0	5.1
Transport, communications	8.8	169.0	52.3	11	171	62	13	170	78	17	171	97	22	180	121	4.7	4.4
Trade	12.3	321.4	38.3	15	342	44	19	361	53	25	390	63	32	440	73	5.0	3.4
Finance	3.8	39.6	96.1	5	41	118	6	42	156	9	43	201	10	47	214	5.9	4.2
Rents on dwelling houses	1.0	-	-	1	-	-	1	-	-	2	-	-	2	-	-	3.1	-
Public administration	9.6	340.1	28.2	11	355	30	12	366	32	13	386	35	16	425	37	2.6	1.4
Other services . . .	6.0	369.9	16.3	7	384	19	9	393	23	12	411	28	16	449	35	5.0	4.0
Total	124.5	3,325.1	37.5	147	3,324	4	179	3,267	55	222	3,266	68	282	3,401	83	4.3	4.2

Note: The classification of manpower differs from Table 44 because it follows National Accounting categories.
Manpower excludes military personnel and unemployed.

Table 48

Percentage shares of various manufacturing industries in the value added (in 1955 prices) of total manufacturing in the OEEC countries

	1901	1913	1929	1937	1955	1959	Regression coefficient (1)
Food, beverages, tobacco	27	19	15	15	13	12	- 0,221
Basic metals	7	11	11	11	10	[illegible]	0,019
Metal products	16	24	27	27	32	32	0,248
Chemicals	5	6	11	12	15	18	0,217
Textiles	23	18	14	13	9	8	- 0,244
Other manufacturing	22	22	22	22	21	21	- 0,019

(1) Regression of percentage share on time.

Source of data: A. Maizels, "Industrial Growth and World Trade".

Table 49

Projection of p[illegible]ge share of various industries in the value added ([illegible] prices) of manufacturing in Austria

Industry	1958	1970	1975	1980
Food, beverages, tobacco	16.8	14.1	13.0	11.9
Basic metals, foundries	11.3	11.5	11.6	11.7
Machinery, transport equipment, electrical machinery and apparatus, metal products	28.6	31.6	32.8	34.1
Chemicals	9.9	12.5	13.6	14.7
Textiles	9.7	6.8	5.6	4.4
Other manufacturing	23.7	23.5	23.4	23.3
Total (excluding mining and petroleum)	100	100	100	100

Table 50

Active civilian population of the United States according to occupations

in thousands

	1900	1910	1920	1930	1940	1950	1960	1960 Percentage Of total	1960 Percentage Of non agri-cul-tural
Professional, technical and kindred workers	1,234	1,758	2,283	3,311	3,879	5,081	7,324	11.3	12.1
Managers, proprietors, officials, except farm	1,697	2,462	2,803	3,614	3,770	5,155	5,489	8.3	9.1
Clerical and kindred workers	877	1,987	3,385	4,336	4,982	7,232	9,618	14.9	15.9
Sales workers	1,307	1,775	2,058	3,059	3,450	4,133	4,808	7.4	8.0
Manual workers	10,401	14,234	16,974	19,272	20,596	24,265	25,640	39.7	42.4
of which:									
Craftsmen, foremen and kindred workers	3,062	4,315	5,482	6,246	6,203	8,350	9,251	14.3	15.3
Operatives	3,718	5,441	6,587	7,691	9,518	12,030	12,870	19.9	21.3
Labourers	3,620	4,478	4,905	5,335	4,875	3,885	3,519	5.5	5.8
Service workers . . .	2,626	3,562	3,312	4,772	6,069	6,180	7,591	11.7	12.6
of which:									
Private household .	1,579	1,851	1,411	1,998	2,412	1,539	1,815	2.8	3.0
Service workers except household .	1,047	1,711	1,901	2,774	3,657	4,641	5,776	8.9	9.6
Farm workers	10,888	11,533	11,390	10,321	8,995	6,953	4,084	6.3	0
Total	29,030	37,411	42,205	48,685	51,741	58,999	64,554	100.0	100.0

Table 51

Active civilian population of Austria according to occupation, 1961 (1)

Occupations	Occupied persons including unemployed			Occupied persons excluding unemployed		
	Number	% of total man-power	% of non-agricultural man-power	Number	% of total man-power	% of non-agricultural man-power
I. Technical and professional workers	244,587	7.280	9.429	242,797	7.365	9.563
Of which self-employed	33,315	0.992	1.284	33,315	1.011	1.312
II. Managers and Officials	82,557	2.457	3.183	82,458	2.501	3.248
Of which self-employed	12,944	0.385	0.499	12,944	0.393	0.510
III. Sales people	243,263	7.240	9.378	240,451	7.294	9.471
Of which self-employed	71,880	2.139	2.771	71,880	2.180	2.831
IV. Office personnel	281,207	8.369	10.841	278,100	8.436	10.954
Of which self-employed	17	0.001	0.001	17	0.001	0.001
V. Farmers or agricultural workers	766,008	22.798		757,813	22.987	
Of which self-employed	278,510	8.289		278,510	8.448	
VI. Workers in production and transport	1,379,010	41.043	53.164	1,350,239	40.957	53.182
Of which self-employed	97,814	2.911	3.771	97,814	2.967	3.853
VII. Service workers	338,527	10.075	13.051	329,266	9.988	12.969
Of which self-employed	38,767	1,154	1.495	38,767	1.176	1.527
VIII. Others	24,748	0.737	0.954	15,603	0.473	0.615
Of which self-employed	14	0.000	0.001	14	0.000	0.001
Occupied persons, total	3,359,907	100.000		3,296,727	100.000	
Of which self-employed	533,261	15.871		533,261	16.175	
Non-agricultural manpower	2,593,899		100.000	2,538,914		100.000
Of which self-employed	254,751		9.821	254,751		10.034

(1) The classifications in this table have been made with a view to facilitating comparison with the United States.

Table 52

Mechanical projection of the occupational structure in various industries(1)

		Agriculture		Manufacturing, handicrafts		Construction		Electricity, gas, water		Transport, communications		Trade		Finance	
		N	%	N	%	N	%	N	%	N	%	N	%	N	%
Total	1951	1,078	100.0	948	100.0	235	100.0	26	100.0	172	100.0	229	100.0	26	100.0
	1961	760	100.0	1,080	100.0	247	100.0	32	100.0	195	100.0	309	100.0	40	100.0
	1965	669	100.0	1,115	100.0	248	100.0	34	100.0	201	100.0	326	100.0	41	100.0
	1970	557	100.0	1,133	100.0	246	100.0	35	100.0	205	100.0	340	100.0	42	100.0
	1975	447	100.0	1,173	100.0	246	100.0	38	100.0	212	100.0	361	100.0	44	100.0
	1980	336	100.0	1,266	100.0	255	100.0	42	100.0	228	100.0	404	100.0	48	100.0
Technical and professional workers	1951	0	0.0	26	2.7	11	4.8	3	10.1	3	1.0	3	1.2	0	0.7
	1961	0	0.0	33	3.0	14	5.6	3	9.8	5	2.3	3	0.9	0	0.9
	1965	0	0.0	34	3.1	15	5.9	3	9.7	5	2.5	3	0.9	0	1.0
	1970	0	0.0	36	3.2	15	6.1	3	9.6	5	2.6	3	0.8	0	1.0
	1975	0	0.0	38	3.3	16	6.4	4	9.5	6	2.8	3	0.7	0	1.1
	1980	0	0.0	43	3.4	17	6.7	4	9.3	7	3.0	2	0.6	1	1.2
Proprietors (excl. agriculture and trade), managers and officials	1951	-	-	16	1.7	1	0.6	0	1.6	1	0.8	6	2.8	1	5.7
	1961	0	0.0	19	1.7	1	0.6	1	3.8	2	0.8	9	2.8	3	6.7
	1965	0	0.0	19	1.7	1	0.6	1	4.4	2	0.8	9	2.8	3	7.0
	1970	0	0.0	20	1.7	1	0.6	2	5.0	2	0.8	10	2.8	3	7.3
	1975	0	0.0	20	1.7	1	0.6	2	5.7	2	0.8	10	2.8	3	7.6
	1980	0	0.0	22	1.7	1	0.6	3	6.6	2	0.8	11	2.8	4	8.1

Sales personnel including independent small traders	1951	0	0.0	20	2.1	0	0.2	0	0.3	1	0.3	146	63.6	1	3.2
	1961	0	0.0	24	2.2	0	0.1	0	0.4	3	1.7	202	65.6	1	2.6
	1965	0	0.0	25	2.2	0	0.1	0	0.4	4	2.1	216	66.1	1	2.4
	1970	0	0.0	25	2.2	0	0.0	0	0.4	5	2.5	227	66.7	1	2.3
	1975	0	0.0	27	2.3	0	0.0	0	0.4	6	3.0	243	67.4	1	2.1
	1980	0	0.0	30	2.3	-	-	0	0.5	8	3.6	276	68.2	1	1.8
Office personnel	1951	2	0.2	57	6.0	6	2.8	5	19.7	7	3.9	37	16.2	22	84.4
	1961	2	0.2	91	8.4	11	4.6	7	23.1	13	6.7	45	14.5	33	84.1
	1965	1	0.2	101	9.1	13	5.1	8	24.0	15	7.4	46	14.0	34	83.9
	1970	1	0.2	111	9.8	14	5.6	0	25.1	17	8.2	46	13.5	35	83.8
	1975	1	0.2	124	10.6	15	6.2	10	26.2	19	9.2	47	13.0	37	83.7
	1980	1	0.2	147	11.6	18	7.0	12	27.6	23	10.3	50	12.3	40	83.5
Workers in production (including agriculture)	1951	1,075	99.8	821	86.6	215	91.3	17	66.3	157	91.2	35	15.3	1	2.4
	1961	758	99.7	891	82.5	218	88.2	19	59.5	167	85.4	43	13.8	1	1.8
	1965	667	99.7	908	81.4	217	87.4	20	57.6	168	83.8	44	13.4	1	1.6
	1970	555	99.7	908	80.2	213	86.4	19	55.5	168	82.0	44	12.9	1	1.5
	1975	446	99.7	924	78.8	210	85.4	20	53.2	170	80.0	45	12.4	1	1.3
	1980	335	99.7	976	77.1	214	84.0	21	50.3	177	77.6	47	11.7	0	1.0
Service workers	1951	0	0.0	8	0.8	1	0.4	1	1.9	3	1.9	2	0.9	1	3.5
	1961	0	0.0	23	2.1	2	0.9	1	3.5	6	3.1	7	2.4	2	3.9
	1965	0	0.0	28	2.5	3	1.1	1	4.0	7	3.4	9	2.8	2	4.0
	1970	0	0.0	33	2.9	3	1.3	2	4.4	8	3.8	11	3.2	2	4.1
	1975	-	-	39	3.3	4	1.4	2	5.0	9	4.2	14	3.8	2	4.2
	1980	-	-	49	3.9	4	1.7	2	5.6	11	4.7	18	4.4	2	4.4

(1) The data in this table result from the assumption that the occupational structure in the various industries will change up to 1980 in the same way as it changed between 1951 and 1961 (as a function of the anticipated gross national product per capita). This assumption is, however, by no means realistic: the table purports merely to demonstrate that a continuation of the past trend must lead to a stagnation in the employment of the technical and professional workers. A modified projection is contained in Table 55.

Table 52 (continued)

		Public administration		Other services		Private household and not allotted		All sectors		All sectors excluding agriculture	
		N	%	N	%	N	%	N	%	N	%
Total	1951	146	100.0	309	100.0	102	100.0	3,270	100.0	2,192	100.00
	1961	174	100.0	396	100.0	64	100.0	3,297	100.0	2,537	100.00
	1965	182	100.0	422	100.0	57	100.0	3,295	100.0	2,626	100.00
	1970	187	100.0	443	100.0	51	100.0	3,239	100.0	2,682	100.00
	1975	197	100.0	475	100.0	46	100.0	3,239	100.0	2,792	100.00
	1980	216	100.0	535	100.0	42	100.0	3,372	100.0	3,036	100.00
Technical and professional workers	1951	22	14.9	119	38.3	3	2.6	189	5.8	189	8.61
	1961	27	15.5	133	33.7	2	2.4	219	6.7	219	8.64
	1965	28 (28)	15.6 (15.5)	137	32.4	1	2.4	227 (227)	7.0 (6.9)	227	8.64
	1970	30 (29)	15.8 (15.5)	137	31.0	1	2.5	231 (230)	7.1 (7.1)	231	8.61
	1975	32 (30)	16.0 (15.5)	140	29.4	1	2.4	239 (238)	7.4 (7.3)	239	8.56
	1980	35 (33)	16.3 (15.5)	147	27.5	1	2.3	257 (255)	7.6 (7.6)	257	8.45
Proprietors (excl. agriculture and trade), managers and officials	1951	42	28.8	4	1.3	0	0.2	74	2.3	74	3.36
	1961	40	22.9	6	1.5	0	0.2	80	2.4	80	3.15
	1965	39 (42)	21.2 (22.9)	6	1.5	0	0.3	81 (84)	2.5 (2.6)	81	3.09
	1970	36 (43)	19.4 (22.9)	7	1.6	0	0.3	81 (87)	2.5 (2.7)	81	3.01
	1975	34 (45)	17.4 (22.9)	8	1.6	0	0.3	82 (92)	2.5 (2.8)	81	2.92
	1980	32 (49)	15.0 (22.9)	9	1.7	0	0.4	85 (102)	2.5 (3.0)	85	2.80

Sales personnel including in-dependent, small traders	1951	0		0.0		3	0.8	1	0.7	171		5.2		170	7.77
	1961	0		0.0		6	1.6	1	1.9	238		7.2		238	9.39
	1965	0	(0)	0.0	(0.0)	7	1.8	1	2.4	255	(255)	7.7	(7.7)	255	9.69
	1970	0	(0)	0.0	(0.0)	9	2.0	2	3.1	269	(269)	8.3	(8.3)	269	10.03
	1975	0	(0)	0.0	(0.0)	11	2.2	2	4.0	290	(290)	9.0	(9.0)	290	10.38
	1980	-	(0)	-	(0.0)	13	2.5	2	5.4	330	(330)	9.8	(9.8)	330	10.87
Office personnel	1951	33		22.5		21	6.9	4	4.2	195		6.0		193	8.79
	1961	47		27.2		33	8.2	2	3.3	284		8.6		283	11.15
	1965	52	(50)	28.5	(27.2)	36	8.6	2	3.2	308	(306)	9.4	(9.3)	307	11.69
	1970	56	(51)	29.9	(27.2)	40	9.0	2	3.2	330	(325)	10.2	(10.0)	329	12.27
	1975	62	(54)	31.5	(27.2)	45	9.4	1	3.1	362	(353)	11.2	(10.9)	361	12.92
	1980	72	(59)	33.4	(27.2)	53	9.9	1	2.9	417	(403)	12.4	(12.0)	416	13.70
Workers in production (including agriculture)	1951	8		5.4		18	5.8	17	16.5	2,363		72.3		1,288	58.76
	1961	13		7.6		20	5.0	9	13.5	2,138		64.8		1,380	54,50
	1965	15	(14)	8.3	(7.6)	20	4.8	8	13.5	2,967	(2,066)	62.7	(62.7)	1,399	53,29
	1970	17	(14)	8.9	(7.6)	20	4.6	7	13.8	1,952	(1,950)	60.3	(60.2)	1,397	52.00
	1975	19	(15)	9.7	(7.6)	21	4.3	6	13.7	1,861	(1,857)	57.5	(57.3)	1,415	58.69
	1980	23	(17)	10.6	(7.6)	21	4.0	6	13.5	1,821	(1,815)	54.0	(53.8)	1,486	48.95
Service workers	1951	41		28.4		145	46.8	77	75.8	279		8.5		279	12.71
	1961	47		26.8		198	50.0	50	78.6	337		10.2		337	13.27
	1965	48	(49)	26.4	(26.8)	215	50.9	45	78.2	357	(358)	10.8	(10.9)	357	13.59
	1970	48	(50)	25.9	(26.8)	230	51.9	39	77.1	376	(377)	11.6	(11.6)	376	14.00
	1975	50	(53)	25.4	(26.8)	252	53.0	35	76.5	406	(408)	12.5	(12.6)	406	14.53
	1980	53	(58)	24.7	(26.8)	291	54.4	32	75.5	462	(467)	13.7	(13.8)	462	15.22

Table 53

Stock of occupied graduates of different types of university faculties in Austria

Faculty or school	1951	1961
Theology	6,725	6,468
Law and political science	14,149	15,811
of which:		
Law (doctors of)		14,624
Political science		607
Economics		580
Medicine	12,525	13,974
Liberal arts	13,909	14,706
of which:		
Science (doctors of)		2,276
Pharmacy (doctors or magister)		2,837
Engineering	14,954	14,040
Agriculture	3,357	3,282
Business administration	5,753	6,641
Total of above faculties	71,372	74,922
Veterinary medicine	5,568	1,553
Graduates of art schools, music and drama, others (interpreters, translators, actuaries, jurists without doctorate)		10,349
Total number of university graduates according to the population census	76,940	86,824

Table 54

Occupation and education in manufacturing

(End of 1964)[1]

		Highest educational level		Intermediate technical & commercial schools	Compulsory education	Total	%
		University graduates	Secondary school certificate				
Managers	N	1,444	1,001	475	98	3,018	0.5
	%	47.8	33.2	15.7	3.3	100.0	
Technical staff . .	N	4,005	10,834	11,011	7,766	33,616	5.5
	%	11.9	32.2	32.8	23.1	100.0	
Commercial staff . .	N	2,886	9,123	35,063	22,449	69,521	11.4
	%	4.2	13.1	50.4	32.3	100.0	
Foremen	N	5	183	6,787	7,405	14,380	2.4
	%	0.0	1.3	47.2	51.5	100.0	
Skilled workers . .	N	-	40	8,838	126,180	135,058	22.1
	%	-	0.0	6.6	93.4	100.0	
Other manual workers	N	4	67	3,874	351,736	355,681	58.2
	%	0.0	0.0	1.1	98.9	100.0	
Total employment . .	N	8,344	21,248	66,048	515,634	611,274	
	%	1.4	3.5	10.8	84.4		100.0

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[1] Inflated data based on sample.

Table 55

Occupational structure and education 1961-1980(1)

	Year	Total manpower by occupational group (excluding unemployed)	Percentage distribution of manpower by occupational group		Education of manpower(2) (3)		
			Incl. agri-culture %	Excl. agri-culture %	University graduates	Secondary school graduates	Others
Total	1951	3,270	100.0	100.0			
	1961	3,296	100.0	100.0	87	167	3,043
	1965	3,295	100.0	100.0	96	181	3,018
	1970	3,239	100.0	100.0	106	195	2,938
	1975	3,239	100.0	100.0	120	215	2,904
	1980	3,372	100.0	100.0	142	248	2,995
Technical and professional workers	1951	189	5.8	8.6			
	1961	219	6.7	8.6	64 (29.0%)	74 (33.6%)	82 (37.4%)
	1965	247	7.5	9.4	72	83	92
	1970	280	8.7	10.4	81	94	105
	1975	324	10.0	11.6	94	109	121
	1980	392	11.6	12.9	114	131	147
Proprietors (excl. agriculture and trades), managers and officials	1951	74	2.3	3.4			
	1961	80	2.4	3.2	13 (16.1%)	24 (30.2%)	43 (53.8%)
	1965	83	2.5	3.2	13	25	45
	1970	85	2.6	3.2	14	26	46
	1975	89	2.8	3.2	14	27	48
	1980	97	2.9	3.2	16	29	52
Sales personnel (incl. independent small traders)	1951	171	5.2	7.8			
	1961	238	7.2	9.4	3 (1.4%)	15 (6.4%)	220 (92.2%)
	1965	252	7.7	9.6	3	16	233
	1970	264	8.1	9.8	4	17	243
	1975	280	8.6	10.0	4	18	258
	1980	314	9.3	10.3	4	20	290
Office personnel	1951	195	6.0	8.8			
	1961	284	8.6	11.1	5 (1.6%)	38 (13.2%)	242 (85.2%)
	1965	303	9.2	11.5	5	40	258
	1970	319	9.8	11.8	5	42	271
	1975	341	10.5	12.2	6	45	291
	1980	384	11.4	12.6	6	51	327
Farmers and agricultural workers	1951	1,075	32.9				
	1961	758	23.0		1 (0.1%)	2 (0.2%)	755 (99.7%)
	1965	667	20.3		1	2	665
	1970	555	17.1		0	1	554
	1975	446	13.8		0	1	444
	1980	335	9.9		0	1	334
Workers in mining, manufacturing and transport	1951	1,288	39.4	58.8			
	1961	1,380	41.9	54.4	1 (0.1%)	9 (0.6%)	1,370 (99.3%)
	1965	1,387	42.1	52.8	1	9	1,377
	1970	1,366	42.2	50.9	1	9	1,356
	1975	1,364	42.1	48.8	1	9	1,354
	1980	1,407	41.7	46.3	1	9	1,397
Service workers	1951	279	8.5	12.7			
	1961	337	10.2	13.3	1 (0.2%)	6 (1.8%)	330 (98.0%)
	1965	355	10.8	13.5	1	6	348
	1970	370	11.4	13.8	1	7	362
	1975	395	12.2	14.1	1	7	387
	1980	444	13.2	14.6	1	8	448

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(1) The occupational structure in this table is derived from Table 8, with the following modifications: the proportion of various occupations in the government sector has been left at the 1961 level. The overall proportion of technical and professional workers has been assumed to increase between 1961 and 1980 at the same annual rate as in the United States in the 1950's.

(2) These data are given for occupied persons including unemployed in the census; it has been assumed that the unemployed were neither university nor secondary school graduates.

(3) It has been assumed that the percentage of university and secondary school graduates will remain at the 1961 level. This assumption can be justified only with respect to the average of all occupations, so that the number of graduates in the individual occupational groups is not realistic.

Table 56

Wastage rates per annum of skilled labour in certain trades, 1951-1961

Trade	Numbers trained	Stock of manpower		Increase in Stock 1951-1961		Wastage 1951-1961	
	1951-1961	1951	1961	Absolute	As an annual percentage	Absolute	As a percentage of the average stock per annum
Stone masons, stone cutters	987	3,344	3,090	- 254	- 0.8	1,241	3.86
Brick makers	19	11,747	7,844	- 3,903	- 4.0	3,922	4.09
Potters (incl. chimney builders and floor tilers)	1,271	2,279	2,920	641	2.6	630	2.44
Bricklayers	21,557	55,078	58,229	3,151	0.6	18,406	3.25
Carpenters	6,394	25,180	22,664	- 2,516	- 1.1	8,910	3.73
Tilers	609	3,350	2,943	- 407	- 1.3	1,016	3.24
House painters	6,780	17,649	21,547	3,898	2.1	2,882	1.48
Glaziers	1,060	2,379	2,010	- 369	- 1.7	1,429	6.53
Chimney sweeps	1,076	2,145	2,303	158	0.7	918	4.13
Metal founders	1,650	5,815	6,332	517	0.9	1,133	1.87
Blacksmiths	5,928	17,468	12,481	- 4,987	- 3.4	10,915	7.39
Coppersmiths, plumbers	6,006	9,779	9,990	211	0.2	5,795	5.86
Metal fitters, tool-makers, etc	37,956(1)	68,487	77,462	8,975	1.3	28,981	3.98
Mechanics, motor car mechanics	14,487	24,745	30,726	5,981	2.2	8,506	3.08
Orthopedic mechanics, bandagists	260	606	566	- 40	- 0.7	300	5.12
Gun makers	196	526	543	17	0.3	179	3.35
Watch makers	738	2,747	2,456	- 291	- 1.1	1,029	3.96
Turners	3,402	13,805	12,564	- 1,241	- 1.0	4,643	3.53
Metal printers	154	444	417	- 27	- 0.6	181	4.21
Metal embossiers, engravers	168	1,203	1,042	- 161	- 1.5	329	2.94
Jewellers, gold- and silver-smiths	768	1,771	1,944	173	1.0	595	3.21
Electricians	17,813(1)	35,348	44,946	9,598	2.4	8,215	2.06
Timber cutters	1,737	23,105	13,342	- 9,763	- 5.4	11,500	6.55
Cabinet makers, etc.	25,804	54,677	50,772	- 3,905	- 0.8	29,709	5.64
Casket makers	567	3,926	1,714	- 2,212	- 8.1	2,779	10.71
Wood workers, comb- and toymakers	121	1,916	1,301	- 615	- 3.9	736	4.66
Wood carvers etc.	402	2,132	1,539	- 593	- 3.3	995	5.49
Basket and brush makers	476	2,503	1,935	- 568	- 2.6	1,044	4.74
Musical instrument makers	234	765	615	- 150	- 2.2	384	5.60
Gilders	70	126	158	32	2.3	38	2.70
Upholsterers, mattress makers	2,991	3,505	5,181	1,676	4.1	1,315	3.09
Tanners, leather workers, saddle makers, etc.	2,198	12,308	8,019	- 4,289	- 4.3	6,487	6.53
Weavers	603	17,460	11,749	- 5,711	- 4.0	6,314	4.41
Lace makers, rope makers, etc.	153	1,456	1,118	- 338	- 2.7	491	3.85
Tailors	26,056	57,613	44,213	-13,400	- 2.7	39,456	7.82
Milliners	734	2,832	1,631	- 1,201	- 5.5	1,935	9.00
Makers of artificial flowers etc.	110	623	417	- 206	- 4.0	316	6.20
Umbrella makers	128	641	542	- 99	- 1.7	227	3.85
Furriers	634	2,264	2,311	47	0.2	587	2.57
Fine darners	17	387	304	- 83	- 2.4	100	2.92
Shoemakers	5,182	31,339	24,137	- 7,202	- 2.6	12,394	4.51
Printers, compositors and other graphic trades	2,965	8,787	9,851	1,064	1.2	1,901	2.04
Photographers	736	2,465	2,357	- 108	- 0.5	844	3.50
Millers	1,751	7,311	4,374	- 2,937	- 5.1	4,688	8.29
Bakers	14,294	26,524	27,948	1,424	0.5	12,870	4.73
Butchers	9,107	16,994	17,011	17	+ 0.0	8,090	5.35
Chemical cleaners and dyers	368	1,842	1,763	- 79	- 0.4	447	2.48
Hairdressers	10,809	17,295	19,033	1,738	1.0	9,071	5.00

(1) Including intermediate technical school leavers.

Table 57

Age-specific wastage rates per worker per year for manual and non-manual workers - in percentage figures

Age	Men						Women					
	1960 A	1961-62 B	1962-63 B	1963-64 B	1964-65 B	Ø 1961-1964 B	1960 A	1961-62 B	1962-63 B	1963-64 B	1964-65 B	Ø 1961-1964 B
						Manual workers						
- 19	0.13						0.04					
20 - 24	0.27	5.04	5.78	2.36	1.92	3.54	0.14	7.42	8.95	7.77	9.21	8.33
25 - 29	0.30	3.66	2.75	1.95	0.05	1.81	0.22	4.83	3.86	6.34	4.57	4.89
30 - 34	0.44	3.34	2.34	2.25	0.24	1.96	0.28	2.50	1.16	3.17	0.78	1.63
35 - 39	0.54	2.59	2.16	2.12	0.09	1.25	0.32	0.96	0.46	1.89	.	0.52
40 - 44	1.01	1.05	4.10	2.54	0.11	1.28	0.65	0.71	4.43	0.23	.	0.43
45 - 49	6.74	1.75	0.55	1.58	4.17	1.49	0.86	0.07	0.46	1.71	1.65	0.08
50 - 54	2.79	1.60	1.99	3.50	1.22	2.06	2.14	0.19	4.30	0.29	1.83	1.49
55 - 59	4.99	4.00	8.02	1.41	6.87	5.10	10.70	11.25	16.88	9.46	13.57	12.55
60 - 64	16.49	22.67	28.96	27.41	43.88	30.71	61.14	34.06	27.34	17.79	25.49	25.47
65 - 69	96.47	47.92	37.05	27.77	32.85	37.37	21.17	18.84	22.29	13.08	16.70	17.85
70 and over	16.50	12.76	30.13	20.31	23.51	21.91	36.59	15.01	21.32	19.60	20.42	19.15
						Non-manual workers						
- 19	0.08						0.02					
20 - 24	0.22			0.15			0.07	5.08	3.89	4.12	4.37	4.34
25 - 29	0.22			0.95			0.17	6.93	4.27	2.99	3.95	4.36
30 - 34	0.23		1.23	-	0.39	0.14	0.27	5.06	1.79	-	0.46	0.89
35 - 39	0.31	0.05	1.21	1.77	0.35	0.55	0.30	3.25	0.78	0.20	0.06	0.47
40 - 44	0.37	0.42	0.14	0.84	0.93	0.37	0.49	1.17	0.67	0.10	-	0.01
45 - 49	0.64	0.54	1.11	0.09	0.21	0.14	0.75	1.02	-	0.15	0.09	-
50 - 54	1.42	1.27	1.61	1.03	0.92	0.77	1.62	1.15	0.13	2.24	0.39	0.64
55 - 59	2.83	3.85	3.47	2.75	6.97	3.09	9.84	15.50	12.97	14.46	12.24	13.82
60 - 64	9.64	18.17	20.87	19.84	29.50	22.09	51.51	39.15	24.11	23.82	29.11	29.51
65 - 69	60.18	45.51	33.34	28.22	37.82	36.96	18.49	36.86	18.76	18.14	37.00	28.34
70 and over	12.80	26.55	24.43	25.57	35.17	27.77	14.90	27.09	20.47	24.23	40.97	28.57

A: Approach A (Wastage due to death, incapacity and retirement)

B: Approach B (Comparison of number of employed people of a given birth cohort in two successive years)

Table 58

Wastage rates of manual and non-manual workers - as an annual percentage

	1961-1962				1962-1963				1963-1964		1964-1965		1961-1964	
	Men		Women		Men		Women		Men	Women	Men	Women	Men	Women
	A	B	A	B	A	B	A	B	B	B	B	B	B	B
Manual workers	2.73	4.32	2.88	4.09		4.69		5.09	3.67	4.36	3.92	4.50	3.89	4.20
Non-manual workers	2.19	2.53	1.72	4.37		2.66		2.54	2.37	2.55	3.16	2.57	2.46	2.73

A. Approach A (probability of death or retirement for reasons of incapacity or age).

B. Approach B (based on comparison of number of employed people of the same age in two successive years).

Source: Social Security data.

Table 59

Physicians: Age distribution(1)

Age	Men		Women		Total	
	Absolute numbers	%	Absolute numbers	%	Absolute numbers	%
20 - 24	24	0.234	11	0.462	35	0.276
25 - 29	398	3.876	153	6.431	551	4.357
30 - 34	568	5.532	159	6.683	727	5.749
35 - 39	1,314	12.798	485	20.387	1,799	14.226
40 - 44	2,191	21.340	663	27.869	2,854	22.568
45 - 49	1,710	16.655	295	12.400	2,005	15.855
50 - 54	1,661	16.178	324	13.619	1,985	15.697
55 - 59	878	8.552	137	5.759	1,015	8.026
60 - 64	662	6.448	78	2.379	740	5.852
65 - 69	444	4.325	52	2.186	496	3.922
70 - 74	246	2.396	15	0.631	261	2.064
75 and over . .	171	1.666	7	0.294	178	1.408
Total	10,267	100.000	2,379	100.000	12,646	100.000

(1) 1st January, 1965.

Table 60

Physicians: Age distribution

	Age groups																							
	20-24		25-29		30-34		35-39		40-44		45-49		50-54		55-59		60-64		65-69		70-74		75-79		Total	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
Hospital practitioners	24	11	361	143	259	61	140	47	68	38	15	11	7	5	-	4	-	1	-	1	-	-	-	-	874	322
General practitioners(1)a	-	-	7	-	47	2	263	58	757	156	834	113	877	116	457	55	345	30	235	22	130	4	88	3	4,040	559
b	-	-	21	6	116	47	143	139	160	149	89	41	83	48	40	14	28	7	13	2	5	2	5	1	733	456
c	-	-	28	6	163	49	406	197	947	305	923	154	960	164	497	69	373	37	248	24	135	6	93	4	4,773	1,015
Specialists(1) a	-	-	6	4	60	17	466	134	861	210	644	101	605	119	345	50	266	37	178	25	102	9	77	2	3,610	708
b	-	-	3	-	86	32	302	107	315	110	128	29	89	36	36	14	23	3	18	2	9	-	1	1	1,010	334
c	-	-	9	4	146	49	768	241	1,176	320	772	130	694	155	381	64	289	40	196	27	111	9	78	3	4,620	1,042
of which:																										
Anaesthetists	-	-	-	-	6	6	24	35	37	30	7	4	2	2	-	-	-	-	-	-	-	-	-	-	76	77
Occulists	-	-	-	-	3	5	38	24	46	18	26	5	30	12	12	4	11	4	9	1	6	1	8	-	189	74
Surgeons	-	-	-	-	11	1	72	1	102	4	72	1	82	1	57	1	39	-	18	1	6	-	6	-	465	10
Accident surgeons	-	-	-	-	8	-	28	-	42	-	17	-	15	-	5	-	2	-	1	-	-	-	1	-	119	-
Gynaecologists	-	-	-	-	7	1	59	12	92	13	70	7	62	10	36	3	18	3	15	2	16	-	7	-	382	51
Laryngologists	-	-	-	-	7	-	37	1	53	8	39	-	38	6	18	-	16	-	11	2	3	-	10	-	232	17
Dermatologists	-	-	-	-	1	4	14	5	53	8	27	5	32	6	7	4	14	-	9	1	6	1	5	-	168	34
Internists	-	-	-	-	39	8	150	19	181	27	109	9	101	9	64	5	52	3	26	-	9	1	9	-	740	81
Pediatricians	-	-	-	-	7	3	35	27	37	46	34	34	30	40	19	16	9	8	12	9	3	4	7	-	194	187
Pulmonary specialists	-	-	-	-	-	1	17	2	60	10	40	7	48	6	8	3	13	1	6	-	6	-	1	-	199	30
Medical laboratory tests	-	-	-	-	-	-	1	-	2	1	1	1	5	-	2	-	1	1	2	1	1	-	1	-	16	4
Neurologists	-	-	-	-	4	1	37	9	59	22	46	9	38	9	19	5	10	2	11	1	5	-	3	2	232	60
Orthopedists	-	-	-	-	4		24	1	22	-	12	3	17	1	7	-	7	-	4	-	1	-	4	-	102	5
Physical therapists	-	-	-	-	-	-	2	5	13	6	12	2	1	5	5	1	4	-	2	-	2	-	-	-	41	19
X-Ray doctors	-	-	-	-	8	-	35	8	59	5	35	3	38	3	22	1	17	-	9	-	6	-	-	-	229	20
Urologists	-	-	-	-	1	-	22	1	30	-	13	-	13	-	8	-	8	-	-	-	3	-	2	-	100	1
Dentists	-	-	9	4	39	19	163	91	274	122	201	40	132	43	88	21	64	18	55	9	35	2	14	-	1,074	369
Others	-	-	-	-	1	-	9	-	14	-	11	-	10	2	4	-	4	-	6	-	3	-	-	1	62	3

(1) (a) Doctors with private practice
    (b) Doctors without private practice
    (c) All

Table 61

Physicians: wastage according to cause, 1951-1964

	Death		Cessation of professional activity		Emigration		Other causes(1)		Total	
	Absolute	Percentage	Absolute	Percentage	Absolute	Percentage	Absolute	Percentage	Absolute	Percentage
1951	114	1.026	36	0.324	64	0.576	5	0.045	219	1.970
1952	115	1.018	67	0.593	85	0.752	26	0.230	293	2.594
1953	101	0.880	56	0.488	68	0.592	18	0.157	243	2.117
1954	131	1.123	38	0.326	77	0.660	21	0.180	267	2.290
1955	85	0.718	64	0.540	66	0.557	20	0.169	235	1.984
1956	124	1.031	54	0.449	51	0.424	19	0.158	248	2.062
1957	132	1.081	62	0.508	54	0.442	8	0.066	256	2.097
1958	129	1.041	62	0.500	38	0.307	22	0.178	251	2.026
1959	128	1.018	69	0.549	59	0.469	24	0.191	280	2.227
1960	130	1.019	57	0.447	40	0.314	14	0.110	241	1.890
1961	120	0.929	82	0.635	39	0.302	17	0.132	258	1.996
1962	138	1.076	48	0.374	49	0.382	24	0.187	259	2.019
1963	139	1.093	74	0.582	47	0.369	25	0.196	285	2.240
1964	142	1.123	62	0.490	33	0.261	13	0.103	250	1.977

(1) e.g. marriage.

Table 62

Physicians: age specific wastage

Age group	As a percentage per annum				Average 1961-64
	1961	1962	1963	1964	
20 - 24	4.545	6.918	6,870	1.790	5.031
25 - 29	2.949	4.277	4.932	1.737	3.474
30 - 34	1.474	1.663	1.787	1.386	1.578
35 - 39	1.029	1.158	1.232	0.810	1.057
40 - 44	1.133	0.864	0.897	0.733	0.907
45 - 49	1.050	0.817	0.860	0.776	0.876
50 - 54	0.876	1.670	0.956	1.107	1.152
55 - 59	2.392	2.352	1.903	2.151	2.200
60 - 64	4.968	4.391	4.713	4.143	4.554
65 - 69	8.863	7.720	9.182	8.862	8.657
70 - 74	12.944	12.285	16.201	11.422	13.213
75 - 79	13.757	14.417	21.864	18.349	17.097

Table 63

Physicians: prospective wastage from 1961 stock

	Survivors from the stock of 1965				Wastage					
	1965	1970	1975	1980	1965-1969 per annum		1970-1974 per annum		1975-1979 per annum	
					N	%	N	%	N	%
20 - 24	35				6	1.2				
25 - 29	551	29			63	12.6	3	0.6		
30 - 34	727	488	26		46	9.2	31	6.2	2	0.4
35 - 39	1,799	681	457	24	85	17.0	32	6.4	22	4.4
40 - 44	2,854	1,714	649	435	123	24.6	74	14.8	28	5.6
45 - 49	2,005	2,731	1,640	621	115	23.0	157	31.4	94	18.8
50 - 54	1,985	1,890	2,574	1,546	156	31.2	148	29.6	202	40.4
55 - 59	1,015	1,829	1,742	2,372	151	30.2	272	54.4	259	51.8
60 - 64	740	864	1,557	1,483	193	38.6	225	45.0	406	81.2
65 - 69	496	547	639	1,151	186	37.2	206	41.2	240	48.0
70 - 74	261	310	341	399	121	24.2	144	28.8	158	31.6
75 - 79	178	140	166	183	178	35.6	140	28.0	166	33.2
Total wastage	12,646	11,223	9,791	8,214	1,423	284.6	1,432	286.4	1,577	316.3

Table 64

Physicians: Number of doctors per 10,000 inhabitants

Doctors	Austria	Bundesländer								
		Vienna	Lower Austria	Upper Austria	Salzburg	Tyrol	Vorarl-berg	Kärnten	Steier-mark	Burgen-land
Population	7,073,807	1,627,566	1,374,012	1,131,623	347,292	462,899	226,323	495,226	1,137,865	271,001
All doctors	18.1	31.6	11.7	12.7	18.3	20.0	12.6	13.6	16.3	8.5
Hospital practitioners	1.9	3.5	0.8	1.1	2.4	3.0	0.5	1.0	1.9	0.4
General practitioners	8.2	11.7	6.9	6.9	8.4	7.7	5.4	6.8	8.0	5.8
Specialists	8.0	16.4	4.0	4.7	7.5	9.3	6.7	5.8	6.4	2.3
of which:										
Anasthetists	0.2	0.5	0.1	0.2	0.2	0.2	0.2	0.1	0.2	0.1
Occulists	0.4	0.8	0.2	0.2	0.4	0.3	0.2	0.2	0.4	0.1
Surgeons	0.7	1.2	0.4	0.3	0.7	1.0	0.5	0.4	0.6	0.4
Accident surgeons . .	0.2	0.2	0.1	0.2	0.3	0.2	0.2	0.2	0.1	-
Gynecologists	0.6	1.4	0.3	0.4	0.6	0.5	0.4	0.4	0.4	0.2
Laryngologists	0.4	0.7	0.2	0.2	0.3	0.4	0.3	0.3	0.2	0.1
Dermatologists	0.3	0.7	0.1	0.2	0.2	0.3	0.2	0.1	0.2	0.0
Internists	1.2	2.6	0.5	0.6	1.0	1.2	0.7	0.8	1.0	0.3
Pediatricians	0.5	1.2	0.3	0.3	0.5	0.6	0.6	0.4	0.3	0.1
Pulmonary diseases . .	0.3	0.5	0.3	0.3	0.3	0.4	0.4	0.2	0.3	0.2
Medical laboratory tests	0.0	0.1	-	-	-	0.1	-	-	-	-
Neurologists	0.4	0.9	0.2	0.2	0.4	0.5	0.4	0.2	0.4	0.0
Orthopedists	0.2	0.3	0.1	0.1	0.1	0.2	0.1	0.1	0.2	0.1
Physical therapists .	0.1	0.3	0.0	-	0.0	0.1	-	0.1	0.0	-
X-Ray doctors	0.4	0.8	0.2	0.2	0.3	0.3	0.2	0.3	0.2	0.1
Urologists	0.1	0.3	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.0
Dentists	2.0	3.6	1.0	1.4	1.9	2.8	2.1	1.9	1.9	0.6
Others	0.1	0.3								

Table 65

Ratio of the number of engineers etc. to the number of manual workers in the United States 1900-1960

a: Ratio of specialists to manual workers

b: Growth rate of the ratio per annum

		1900	1910	1920	1930	1940	1950	1960	Growth rate 1900 to 1960
Chemists	a	0.083	0.111	0.166	0.234	0.279	0.317		
	b	(2.96)	(4.00)	(3.43)	(1.77)	(1.30)			(2.69)
Engineers, technical .	a	0.361	0.542	0.790	1.128	1.444	2.238	3.392	
	b	(4.07)	(3.77)	(3.56)	(2.47)	(4.38)	(4.16)		(3.73)
of which:									
Engineers, civil . .	a	0.193	0.279	0.330	0.454	0.471	0.526	0.623	
	b	(3.69)	(1.68)	(3.19)	(0.35)	(1.11)	(1.70)		(1.95)
Engineers, chemical. metallurgical, . . . mining	a	0.030	0.052	0.068	0.073	0.125	0.233	0.281	
	b	(5.42)	(2.66)	(0.72)	(5.43)	(6.18)	(1.90)		(3.72)
Engineers, electrical, industrial, aero-nautical, mechanical	a	0.138	0.211	0.392	0.601	0.848	1.479	2.257	
	b	(4.26)	(6.20)	(4.26)	(3.45)	(5.56)	(4.22)		(4.66)
Accountants and . . . auditors	a	0.220	0.276	0.698	0.994	1.156	1.609	1.852	
	b	(2.24)	(2.29)	(3.54)	(1.51)	(3.31)	(1.41)		(3.55)
Architects	a	0.102	0.115	0.101	0.119	0.106	0.105	0.118	
	b	(1.22)	(-1.27)	(1.58)	(-1.10)	(-0.16)	(1.24)		(0.25)
Designers, draftsmen .	a	0.173	0.317	0.394	0.510	0.553	0.693	1.117	
	b	(6.05)	(2.18)	(2.58)	(0.82)	(2.25)	(4.78)		(3.11)
Librarians	a	0.028	0.052	0.090	0.154	0.191	0.234	0.333	
	b	(6.21)	(5.47)	(5.34)	(2.19)	(2.02)	(3.52)		(4.13)
Nurses,professional .	a	0.113	0.578	0.879	1.526	1.892	2.023	2.529	
	b	(16.29)	(4.18)	(5.52)	(1.81)	(1.01)	(2.23)		(5.17)
Pharmacists	a	0.442	0.381	0.378	0.435	0.401	0.372	0.362	
	b	(-1.52)	(-0.08)	(1.39)	(-0.81)	(-0.75)	(-0.29)		(-0.34)
Radio operators . . .	a	.	0.025	0.027	0.026	0.034	0.069	0.118	
	b		(0.75)	(-[illegible])	(2.70)	(7.18)	(5.34)		(3.13)
Surveyors	a	0.057	0.059	0.054	0.075	0.082	0.110	0.182	
	b	(0.32)	(-0.85)	(3.28)	(0.89)	(2.94)	(4.99)		(1.93)
Veterinarians	a	0.078	0.082	0.079	0.062	0.054	0.056	0.060	
	b	(0.42)	(-0.29)	(-2.56)	(-1.36)	(0.48)	(0.55)		(-0.46)
Scientists	a	0.038	0.056	0.112	0.239	0.447	0.824	1959 1,209	
	b	(3.79)	(6.89)	(7.57)	(6.27)	(6.13)	(4.26)		(5.84)
Professional,technical and kindred workers	a	11.867	12.347	13.447	17.179	18.831	20.937	28.568	
	b	(0.40)	(0.85)	(2.45)	(0.92)	(1.06)	(3.11)		(1.46)
Clerical and kindred . workers	a	8.432	13.961	19.942	22.500	24.189	29.803	37.511	
	b	(5.04)	(3.57)	(1.21)	(0.72)	(2.09)	(2.30)		(2.49)
Salesworkers	a	12.563	12.329	12.127	15.873	16.752	17.033	18.751	
	b	(-0.19)	(-0.16)	(2.69)	(0.54)	(0.17)	(0.96)		(0.67)
White-collar workers .	a	49.176	55.932	62.027	74.303	78.078	89.019	106.238	
	b	(1.29)	(1.03)	1.81)	(0.50)	(1.31)	(1.77)		(1.28)

Table 66

Number and density (percentage of total employment) of highly skilled personnel in manufacturing industries, end of 1984

		University graduate engineers	Agro-nomists			Pharma-cists	Doctors and veteri-narians	Lawyers	Psycholo-gists	Business adminis-tration	Other university graduates	Secondary school engineers	Secondary level business academy graduates	Other secondary school graduates
				Total	of which chemists									
Coal mining	N	82	2	2	1	-	-	10	-	2	1	49	23	2
	%	0.70	0.02	0.02	0.01	-	-	0.08	-	0.02	0.01	0.42	0.19	0.02
Other mining	N	179	4	20	9	-	4	19	-	16	3	139	50	16
	%	1.20	0.03	0.13	0.06	-	0.03	0.13	-	0.11	0.02	0.93	0.34	0.11
Iron and steel prod.	N	526	6	28	17	-	10	104	-	173	36	996	366	62
	%	0.99	0.01	0.05	0.03	-	0.02	0.20	-	0.33	0.07	1.88	0.69	0.12
Petroleum	N	119	10	66	26	-	-	25	-	33	10	224	47	7
	%	1.27	0.11	0.71	0.28	-	-	0.26	-	0.35	0.11	2.40	0.50	0.07
Stone, ceramics	N	170	4	24	20	-	4	45	-	81	8	486	190	20
	%	0.56	0.01	0.08	0.07	-	0.01	0.15	-	0.28	0.03	1.59	0.62	0.07
Glass	N	36	3	15	13	-	2	30	-	16	4	81	63	42
	%	0.32	0.03	0.13	0.11	-	0.01	0.26	-	0.14	0.04	0.71	0.56	0.37
Chemicals	N	478	60	350	308	7	43	126	7	276	36	970	364	81
	%	0.93	0.12	0.68	0.60	0.01	0.08	0.24	0.01	0.54	0.07	1.88	0.71	0.16
Paper and paper board	N	98	5	28	27	-	-	40	-	32	3	176	121	20
	%	0.51	0.03	0.15	0.14	-	-	0.21	-	0.17	0.02	0.92	0.64	0.10
Paper products	N	-	-	-	-	-	-	24	-	47	-	-	-	-
	%	-	-	-	-	-	-	0.24	-	0.47	-	-	-	-
Wood products	N	34	4	7	4	-	-	11	-	45	-	183	112	15
	%	0.13	0.01	0.03	0.01	-	-	0.04	-	0.18	-	0.73	0.45	0.06
Food, beverages and tobacco	N	206	197	77	66	-	12	237	3	395	26	457	549	109
	%	0.38	0.36	0.14	0.12	-	0.02	0.44	0.01	0.73	0.05	0.84	1.01	0.20
Leather	N	8	-	2	2	-	-	-	-	10	-	14	12	2
	%	0.27	-	0.07	0.07	-	-	-	-	0.34	-	0.47	0.41	0.07
Leather products	N	-	-	-	-	-	-	18	2	18	-	34	41	5
	%	-	-	-	-	-	-	0.11	0.02	0.11	-	0.21	0.26	0.03
Clothing	N	-	-	-	-	-	-	21	-	21	-	137	126	32
	%	-	-	-	-	-	-	0.06	-	0.06	-	0.40	0.37	0.09
Foundries	N	68	-	8	5	2	2	18	-	13	3	117	29	10
	%	0.60	-	0.07	0.05	0.02	0.02	0.16	-	0.12	0.02	1.04	0.26	0.09
Metal production	N	80	1	14	13	-	1	24	-	15	1	131	28	3
	%	1.01	0.02	0.18	0.16	-	0.02	0.30	-	0.20	0.02	1.67	0.36	0.04
Machinery	N	613	16	13	5	-	21	65	2	103	16	2,304	281	70
	%	1.24	0.03	0.03	0.01	-	0.04	0.13	0.00	0.21	0.03	4.67	0.57	0.14
Vehicles	N	116	7	-	-	-	5	29	-	43	1	321	106	9
	%	0.50	0.03	-	-	-	0.02	0.13	-	0.19	0.01	1.40	0.47	0.04
Iron and metal goods	N	123	-	32	16	-	3	74	-	123	22	632	248	68
	%	0.25	-	0.07	0.03	-	0.01	0.15	-	0.25	0.05	1.28	0.50	0.14
Electrical machinery and apparatus	N	1,015	9	60	10	-	15	78	3	220	46	2,991	388	102
	%	1.87	0.02	0.11	0.02	-	0.03	0.14	0.01	0.41	0.09	5.51	0.72	0.19
Textiles	N	56	4	20	17	-	9	48	2	152	9	783	354	59
	%	0.08	0.01	0.03	0.02	-	0.01	0.07	0.00	0.21	0.01	1.09	0.49	0.08
Total	N	4,007	332	766	559	9	131	1,046	19	1,834	225	11,225	3,498	734
	%	0.66	0.05	0.13	0.09	0.00	0.02	0.17	0.00	0.30	0.04	1.84	0.57	0.12

__Source__: Chamber of Commerce

Table 67

Engineers, scientists, graduates as a percentage of total employment in the "best" firms and in all firms of each manufacturing industry in 1964(1).

	Percentage of employment			
	University graduate engineers	Secondary school engineers	Scientists	All university graduates
1. Coal mining, total	0.70	0.42	0.02	0.84
I	0.81	0.59	0.05	0.96
II	0.78	0.47	0.03	0.97
III	0.76	0.42	0.02	0.92
2. Other mining, total	1.20	0.93	0.13	1.64
I	0.60	2.98	-	1.49
II	1.18	1.61	0.26	1.87
III	1.35	1.38	0.22	1.96
3. Iron and steel production	0.99	1.88	0.05	1.66
I	1.14	2.64	0.05	1.89
II	1.13	2.64	0.05	1.86
III	1.09	2.66	0.05	1.79
4. Petroleum	1.27	2.40	0.71	2.81
I	1.58	4.10	1.58	3.79
II	1.27	2.40	0.71	2.79
III				
5. Stone, ceramics, total	0.56	1.59	0.08	1.10
I	0.51	2.56	0.17	1.36
II	0.89	2.16	0.13	1.65
III	0.83	2.14	0.16	1.70
6. Glass, total	0.32	0.71	0.13	0.92
I	0.78	1.95	-	0.78
II	0.57	1.25	-	1.02
III	0.51	1.19	-	0.93
7. Chemicals, total	0.93	1.88	0.68	2.69
I	0.94	5.00	3.44	5.63
II	1.25	3.68	0.68	5.84
III	1.00	3.60	0.47	3.97
8. Paper, total	0.51	0.92	0.15	1.08
I	0.84	1.39	-	1.39
II	0.58	1.55	0.14	1.30
III	0.71	1.31	0.11	1.50
9. Wood, total	0.13	0.73	0.03	0.40
I	0.59	1.18	0.20	0.98
II	0.31	1.22	0.10	0.51
III	0.32	1.11	0.08	0.87
10. Food, beverages and tobacco, total	0.38	0.84	0.14	2.12
I	0.38	1.90	-	0.38
II	0.66	1.53	0.46	5.24
III	0.48	1.63	0.28	3.44

Table 67 continued

	Percentage of employment			
	University graduate engineers	Secondary school engineers	Scientists	All university graduates
11. Foundries, total	0.60	1.04	0.07	1.02
I	1.07	1.20	0.13	2.13
II	0.64	1.37	0.05	1.10
III	0.62	0.37	0.04	1.04
12. Metal production, total	1.0[illegible]	1.67	0.18	1.74
I	1.83	2.39	0.32	3.19
II	1.51	2.46	0.31	2.71
III	1.47	2.31	0.26	2.52
13. Machinery, total	1.24	4.67	0.03	1.72
I	1.48	10.98	-	1.78
II	1.37	10.56	-	1.78
III	1.87	9.49	-	2.92
14. Vehicles	0.50	1.40	-	0.88
I	0.83	4.96	-	4.96
II	0.68	4.34	-	1.55
III	0.58	4.35	-	1.38
15. Iron and metal goods, total metallware	0.25	1.28	0.07	0.76
I	0.48	3.98	0.08	0.88
II	0.47	3.76	0.07	0.81
III	0.46	2.96	0.04	0.87
16. Electrical machinery and apparatus	1.87	5.51	0.11	2.67
I	2.99	7.94	0.02	3.48
II	3.01	7.81	0.02	3.49
III	2.75	7.75	0.08	3.41
17. Textiles, total	0.08	1.09	0.03	0.42
I	1.02	7.61	-	6.09
II	0.46	4.38	-	1.73
III	0.35	4.14	0.09	1.41

(1) The percentage given under I, II, III refer respectively to the firm with the highest proportion (I), the two firms with the highest proportion (II) and the three firms (III) with the highest proportion of engineers (Graduates plus Secondary School Engineers) in total employment.

Source: Chamber of Commerce.

Table 68

Number of all engineers, etc., in all manufacturing in 1980 on the assumption that the average density of engineers in each branch will then correspond to that which the best firm (I), the two best firms (II) and the three best firms (III) in each branch had in 1964

	University graduate engineers	Secondary school engineers	All engineers	Scientists	University graduates
I	7,142	31,273	38,415	2,570	17,996
II	6,870	26,188	33,053	1,084	16,304
III	6,595	24,701	31,296	916	14,408

Source: Chamber of Commerce

Table 69

Average age of graduates on taking their first degree

	Law	Medicine	Liberal arts	Engineering	Agricultural science	Veterinary science	Commerce	Total
	1961/62							
All graduates	25.6	27.3	27.7	27.0	25.6	27.5	23.8	26.0
Excluding graduates of 30 years of age and older	24.4	25.9	25.4	25.6	25.1	25.9	23.7	24.8
	1962/63							
All graduates	25.4	27.2	26.6	26.7	25.8	27.4	24.0	25.9
Excluding graduates of 30 years of age and older	24.1	25.8	25.1	25.5	24.9	26.0	23.6	24.6
	1963/64							
All graduates	25.1	26.7	27.3	26.8	26.4	27.8	24.8	26.1
Excluding graduates of 30 years of age or older	24.0	25.7	25.1	25.5	25.2	25.1	24.3	24.8

Table 70

Computers in the United States

(excluding military, process control and special purpose)

Beginning of	Number installed	On order
January 1960	3,612	1,364
July 1960	4,257	4,377
January 1961	4,528	6,246
July 1961	5,371	7,437
January 1962	7,305	7,904
July 1962	9,495	7,286
January 1963	11,078	7,097
July 1963	11,926	5,889
January 1964	15,867	5,465
July 1964	18,627	5,741
January 1965	22,496	8,895

Source: The Diebold Group, Newsletter

Table 71

Computers installed in Europe

	End of year:						
	1955	1956	1957	1958	1959	1960	1961
European Community	5	15	55	135	250	470	985
Great Britain	20	35	75	130	170	240	340
Rest of Western Europe		5	10	35	65	100	220
Western Europe	25	55	140	300	485	810	1,545

Source: "Netherlands Automatic Information Processing Research Centre, Amsterdam".

Table 72

Skilled workers as a proportion of all manual workers in manufacturing

Industries	1957	1958	1959	1960	1961	1962	1963	1964
Mining, iron and steel production	39.7	40.9	40.3	40.3	40.2	40.9	36.8	35.2
Petroleum	33.5	32.7	32.7	31.9	31.0	29.4	28.5	22.0
Stone, ceramics	19.1	19.3	19.2	19.5	19.6	20.2	21.4	21.8
Glass	26.0	26.5	25.3	26.0	26.3	26.5	25.0	23.9
Chemicals	24.8	24.1	23.8	23.5	23.2	23.5	23.8	24.1
Paper and paper board	21.7	22.7	23.3	23.0	23.6	24.6	25.6	25.6
Paper products	20.5	20.8	20.9	21.2	19.7	20.0	20.2	19.0
Film studies	66.1	57.6	57.6	57.6	57.6	57.6	57.6	57.6
Wood products	36.3	35.9	36.9	35.9	35.8	35.8	35.1	35.4
Food, beverages and tobacco	28.0	28.4	29.1	29.4	29.2	29.5	30.5	30.7
Leather	18.1	18.4	18.8	16.9	16.6	18.9	16.4	17.1
Leather products	34.5	36.2	33.5	32.6	31.2	31.4	34.1	33.7
Foundries	34.1	30.7	29.5	28.8	28.1	28.6	28.5	26.7
Metal production	26.9	27.2	27.5	25.4	25.1	26.4	22.0	22.2
Machinery	50.9	48.1	49.1	48.8	48.1	48.8	48.7	49.7
Vehicles	45.0	46.1	46.8	46.0	46.2	45.7	45.1	45.1
Iron and metal goods	25.2	26.4	25.9	25.7	25.1	25.6	25.6	25.7
Electrical machinery and apparatus . . .	30.6	30.3	29.9	28.0	27.6	27.7	29.3	28.7
Textiles	26.5	26.6	26.3	26.3	26.2	26.9	26.5	25.8
Clothing	44.2	44.9	45.1	44.7	43.4	42.6	41.2	39.9
Total	32.5	32.6	32.4	32.2	31.9	32.3	31.9	31.5

Annex to Chapter V

PROJECTION OF EXPENDITURES; DETAILED STATEMENT AND A FURTHER EXPLANATION OF METHODS

A. Compulsory Education

1. General compulsory primary, upper primary and special schools and the polytechnic course

Introduction

In principle the operation of public general compulsory schools is the responsibility of the municipalities. Financially, however, the Federal Government pays roughly 60 per cent of all public expenditure on these schools, mainly in the form of teachers' salaries. Whereas the municipalities are responsible for the payment of non-teaching staff, the Federal Government pays all teachers' salaries directly. In those cases where the number of these teachers exceeds the legal ceiling(1) the provinces are obliged to refund the salaries of the extra teachers to the Federal Government. Due to the shortage of teachers outside the capital, this is only the case in Vienna. The city of Vienna is said to be paying approximately 15 per cent of its teachers in general compulsory schools.

Other current expenditure (non-personnel expenditure) is paid by the municipalities.

The same applies to capital expenditure but for investments in new schools special funds have been set up in the various provinces, towards which the provincial governments make substantial contributions. The magnitude of these grants, which also depend on the financial strength of the municipalities involved, is unknown but is said to amount to between one quarter and one half of investment expenditure. It is foreseen that the extension of the length of compulsory school age from eight to nine years and the consequent addition of an extra (polytechnic) year to the general compulsory schools as from 1966/67, will result in such a considerable increase in capital investments by the municipalities, that special measures must be taken to raise the necessary funds. Plans are under consideration to issue a public loan, to the amount of Schillings 1,000 to 2,000 million; the amortisation of this loan would have to be financed by the municipalities but the interest would be paid by the Federal Government.

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(1) For one-class primary schools: one teacher for every five one-class schools, two teachers for special subjects. For the other primary schools: one teacher for every 30 pupils plus 50 per cent of the salaries of teachers for special subjects. For the upper primary schools: one teacher for every 20 pupils. For the special schools: one teacher for every 15 pupils.

The share of private schools (most of them "confessional" schools, run by the orders and congregations of the Roman Catholic church) in general compulsory education is very small.

The number of pupils in these private schools declined from 3.36 per cent of total enrolments in 1955/56 to 3.01 per cent in 1963/64. The number of teachers decreased correspondingly from 4.0 per cent to 3.8 per cent in the same period.

Since in accordance with the Treaty with the Holy See and the 1962 Private School Act, these confessional schools receive a Federal subsidy of the salaries of 60 per cent of their teachers, and since the greater part of this subsidy is in the form of "live subsidies" (teachers employed and paid by the State but working in private schools), the monetary transfer is rather small (Schillings 16.4 million in 1963).

Other current expenditure and capital expenditure for these private schools is paid out of private funds.

Table 73

Public expenditure on primary schools

(Million Austrian Schillings)

	1956		1963	
Federal Government:				
Personnel expenditure	1,104.0		1,659.9	
Minus: refund from provinces	20.8		21.8	
		1,083.2		1,638.1
Transfer to confessional schools for salaries		-		16.4
		1,083.2		1,654.5
Other current expenditure		10.1		48.3
		1,093.3		1,702.8
Provinces (without Vienna)				
Personnel expenditure		0.8		2.8
Other current expenditure		38.3		31.3
Total current expenditure		39.0		34.1
Extraordinary expenditure (capital)		2.0		10.5
		41.0		44.6
Municipalities (including Vienna)				
Direct personnel expenditure		58.6		106.8
Other current:				
1. Salary refund to Federal Government		20.8		21.8
Total personnel		79.4		128.6
2. Material expenditure		307.2(1)		664.0(1)
Total current expenditure		386.6		792.6
Extraordinary expenditure (capital)		165.9		420.7
		552.5		1,213.3
Total public expenditure		1,686.8		2,960.7

(continued)

Table 73 (continued)

Revenue		
Federal Government(2)	0.6	1.5
Provinces	5.4	12.2
Municipalities	53.2	96.6
	59.2	110.3
Total net public expenditure	1,627.6	2,850.4
of which:		
Personnel expenditure	1,163.4	1,785.9
Other current expenditure(3)	267.2	579.7
Capital expenditure	197.0	484.8

(1) Vienna does not keep a separate account of extraordinary expenditure any more; its capital expenditure, amounting to Schillings 29.2 million in 1956 and Schillings 53.6 million in 1963 should therefore be deducted from the amount of current material expenditure, shown above.

(2) Without the salary refund of the provinces which is already deducted from personnel expenditure.

(3) After deduction of revenue.

Expenditure analysis and projection

Personnel expenditure

In 1956 total public personnel expenditure on primary schools (Federal, provincial and municipal expenditure together) amounted to Schillings 1,163.4 million. It is assumed that this was in payment for the teachers and other employees in public primary schools only (34,063).(1) In 1963 the corresponding amount was Schillings 1,785.9 million, which included, however, not only the salaries of teachers in public schools but also those working in private schools as "live subsidies" and the monetary subsidy of Schillings 16.4 million to confessional private schools. It is assumed that this amount was in payment for the 33,782(2) teachers in public schools plus 60 per cent of the 1,349(3) teachers in private schools, making a total of 34,591 teachers. In other words: an increase of 53.66 per cent in personnel expenditure can be compared with a rise of 1.55 per cent in the number of staff, giving a relative increase in expenditure per teacher of 51 per cent.

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(1) To convert school years into calender years two-thirds of the old school year 1955/56 (34,335 teachers) were added to one-third of the new school year 1956/57 (33,520 teachers).

(2) In 1962/63: 33,577 teachers; in 1963/64: 34,192 teachers.

(3) In 1962/63: 1,334 teachers; in 1963/64: 1,379 teachers.

This increase is lower than the nominal increase in gross national product per capita of 69 per cent during the same period but considerably higher than the registered increase in teachers' salary rates of about 35 per cent on average( ). At least part of the difference between the rise in salary rates and the increase in actual personnel expenditure, can be explained by a number of secondary factors such as an increase in social and other fringe benefits, changes in the age structure and sex composition of the staff, etc. Data and time were lacking, however, to make a proper analysis of the influence of these factors, nor to take them into consideration in the projection of future expenditure.

The following projection of public personnel expenditure, in constant 1963 prices, is based on two main assumptions:

(a) Expenditure per teacher (in constant 1963 prices) is expected to rise in the same proportion as the expected real increase in gross national product per head of the employed population. This is a slightly faster increase than was witnessed in the past but in view of the serious shortage of teachers, anticipated for 1970 and 1975, this seems to be more a minimum than a maximum assumption. Nominal salary rates for teachers stayed far behind the increase in average incomes. Increasing them at the same rate in the future would be a sound step but would do nothing to compensate for the arrears accumulated in the past.

(b) The number of teachers is expected to increase at the same rate as the number of pupils. A first estimate of the teacher requirements in 1970 and 1975 anticipated a considerable improvement in the pupil/teacher ratio. In view of the acute shortage of teachers, however, which cannot be expected to be solved in the course of our projection period, it became more and more clear that this improvement was highly unrealistic. In the course of 1965 the Austrian parliament accepted an amendment to the 1962 School Act postponing the improvement of the pupil/classroom ratio. It is, moreover, assumed that the share of private education will remain as it is and that the Federal Government will continue to pay 60 per cent of the salaries of teachers working in private schools, either in the form of "live subsidies" or in the form of money grants.

On the basis of these assumptions the following projection can be made:

	1963	1970	1975
Gross national product per capita (Schillings 1,000)(1).	± 40.5	55	63
Index (1963 = 100)	100	136	168
Number of pupils(2).	758,196	979,409	1,020,308
Index (1963 = 100)	100	129	135
Index 1) x 2).	100	175	227
Public personnel expenditure(3)(Schillings, millions). .	1,785.9	3,125.3	4,054.0

(1) In constant 1954 prices according to Dr. J. Steindl's Preliminary Report (June 1965, Table 2).

(2) According to reference to Second Assessment.

(3) Including subsidies to private schools.

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(1) Scale L_2V : increases between 1956 and 1963 of 41 per cent in the lower to 30 per cent in the upper ranges.
Scale L_2HS : increases from 42 per cent to 28 per cent.

If the present distribution of the financial burden over the various levels of government were to remain constant, personnel expenditure of the Federal Government, the provinces and the municipalities would be as follows (Schillings, millions):

	1963	1970	1975
Federal Government	1,654.5	2,895.3	3,755.7
Provinces (without Vienna	2.8	4.9	6.4
Municipalities (with Vienna)	128.6	225.1	291.9
Total	1,785.9	3,125.3	4,054.0

Other current expenditure

This group of expenditure items, expressed as a percentage of total current expenditure, rose from 19 per cent in 1956 to 24 per cent in 1963. In view of the considerable increase in teachers' salaries projected for 1970 and 1975 it is not to be expected that other current expenditure will rise at the same rate, that is, remain at a constant percentage of 24. If its share in total current expenditure were to fall back to 21 per cent in 1970 and 20 per cent in 1975, which is not an abnormally low percentage for this group of schools, there would still be room for an increase in material expenditure per pupil (in constant prices) of 30 per cent between 1963 and 1975. (It is, moreover, known that part of what is recorded as "material expenditure" of the municipalities and provinces is in fact capital expenditure paid out of the ordinary budget. The magnitude of the amounts involved is not known but said to be some 25 per cent of current material expenditure. Since we are estimating current expenditure here and shall make a separate forecast for capital expenditure elsewhere, there is every reason not to overestimate current expenditure of municipal schools). We have taken this slight relative decrease as a basis for what can be considered a minimum estimate of other current expenditure. Expressed in absolute figures this estimate works out as follows (Schillings, millions):

	1963	1970	1975
Other current expenditure	579.7	830.8	1,013.5
Other current expenditure per pupil (Schillings)	788	875	1,024

If this amount were divided amongst the Federal Government, provinces and municipalities as it was in 1963, the contribution of each level of government would be as follows:

	1963	1970	1975
Federal Government	46.8	67.3	82.1
Provinces	19.1	27.4	33.4
Municipalities	513.8	736.1	898.0

Total current expenditure

Aggregating the estimates, given under personnel expenditure and other current expenditure, gives the following total amounts of current expenditure (excluding investments of Vienna):

Table 74

Total current expenditure on primary schools 1963, 1970, 1975

	1963		1970		1975	
Personnel expenditure	1,785.9	(76%)	3,125.3	(79%)	4,054.0	(80%)
Other current expenditure	579.7	(24%)	830.8	(21%)	1,013.5	(20%)
Total current expenditure	2,365.6	100%	3,956.1	100%	5,067.5	100%
of which:						
Federal expenditure	1,701.3		2,962.6		3,837.8	
Provincial expenditure	21.9		32.3		39.8	
Municipal expenditure	642.4		961.2		1,189.9	

Extraordinary expenditure

Capital expenditure (including investments by Vienna, included in ordinary expenditure) will be estimated separately at the end of this report.

2. Compulsory vocational schools (Berufsbildende Pflichtschulen)

Introduction

In principle the provinces are responsible for the operation and financing of this group of compulsory schools which provide part-time vocational education. The Federal Government, however, pays 50 per cent of all teachers' salaries, of these schools. The other half of it as well as all non-personnel current expenditure and capital expenditure is paid by the provinces. There are no private schools in this sector.

Table 75

Number of schools, classes, pupils and teachers in vocational compulsory schools in 1953/54, 1956/57, 1960/61 and 1964/65

	1953/54	1956/57	1960/61	1964/65
Number of schools	337	317	274	277
Number of classes	3,938	5,407	4,990	5,331
Number of pupils	106,758	151,490	133,755	146,949
Number of teachers	3,354	4,455	3,930	3,844
(of which part-time)	(2,341)	(2,797)	(2,083)	(1,756)

Table 76

Public expenditure on vocational compulsory schools

(In million Schillings)

	1956	1963
A. Federal Government Expenditure on these schools in 1956 and 1963		
Personnel expenditure	85.9	153.5
minus: 50% refund of the provinces	42.2	75.9
	43.7	77.6
Other current expenditure	0.5	3.9
Total	44.2	81.5
Revenue	0.8	0.2

B. Provincial Expenditure (without Vienna)	1956	1963
Personnel	4.9	9.2
Material (including 50% refund of salaries to Federal Government)	44.4	123.7
Total ordinary expenditure	49.3	132.9
Extraordinary expenditure (capital)	3.8	47.8
Total expenditure	53.1	180.7
Revenue	4.0	24.3

C. Expenditure of Vienna	1956	1963
Direct personnel expenditure	7.7	10.5
Salary refund to Federal Government	14.2	21.4
Other current expenditure	6.4	9.9
Total current	28.3	41.8
Capital expenditure	2.1	18.3
Total gross expenditure	30.4	60.1
Revenue	1.2	1.2
Net expenditure	29.2	58.9

Expenditure analysis and projection

Personnel expenditure

	1956	1963
Central government	43.7	77.6
Provinces: 50% refund	42.2	75.9
direct expenditure	12.6	19.7
Total	98.5	173.2

In view of the considerable change in the proportion of part-time teachers, the nominal number of teachers does not give a reliable indication of the change in the size of the staff. We have therefore based the analysis and projection on the number of hours taught, which increased from 493,209 in 1956 to 497,135 in 1963[1] or by 0.8 per cent compared with the above-mentioned increase in personnel expenditure by 75.8 per cent, which means an increase in expenditure per hour taught of 74.4 per cent.

This increase is slightly higher than the nominal increase in gross national product per capita of 69 per cent and much higher than the registered increase in teachers' salary rates (28-46 per cent). This discrepancy could be due to a number of factors which could not be analysed (social and other fringe benefits, changes in age structure, qualifications, the above-mentioned decrease in the number of part-time teachers etc.).

For the purpose of the cost projection it has been assumed that future expenditure will be a function of the rise in gross national product per head of the employed population and of the number of hours taught. Provided the number of pupils per class remains constant at about 27 and there is no change in the number of hours per class, both the number of classes and hours will increase at the same rate as the number of pupils (as projected in the First Assessment):

Table 77

Personnel expenditure, vocational compulsory schools, 1963, 1970, 1975

	1963	1970	1975
1. Number of pupils	149,949	136,492	163,544
Index (1963 = 100)	100	93	111
2. Index gross national product per capita	100	136	168
3. Index (1) x (2)	100	126.5	186.5
4. Personnel expenditure (Million Schillings)	173.2	219.1	323.0

If the share of the Federal Government and the provinces were to remain the same, the contribution of both separately would develop as follows (Million Schillings):

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(1) Taking two-thirds of the old school year and one-third of the new to form one calendar year.

	1963	1970	1975
Federal Government			
Direct personnel expenditure	153.5	194.1	286.2
Minus: 50% refund from provinces	75.9	96.0	141.5
Net personnel expenditure	77.6	98.1	144.7
Provinces (including Vienna)			
50% refund to Federal Government	75.9	96.0	141.5
Direct personnel expenditure	19.7	25.0	36.8
Total personnel expenditure	95.6	121.0	178.3

Table 78

Non-personnel current expenditure, vocational compulsory schools, 1956 and 1963

(In million Schillings)

	1956		1963	
Federal Government		0.5		3.9
Provinces (without Vienna)		16.4		69.2
Vienna		6.4		9.9
Total gross expenditure		23.3		83.0
Minus:				
Revenue: Federal Government	0.8		0.2	
Provinces	4.0		24.3	
Vienna	1.2		1.2	
		6.0		25.7
Net non-personnel expenditure		17.3		57.3

Expressed as a percentage of all current expenditure, net non-personnel expenditure rose from 15 per cent to 25 per cent. No doubt this last percentage is more acceptable for this type of vocational school which is often equipped with expensive machinery and other equipment. We have assumed the percentage of 25 to remain constant over the whole of the projection period and estimated future non-personnel current expenditure as follows:

	1963	1970	1975
Federal Government	3.7	4.7	7.1
Provinces (without Vienna)	44.9	57.2	84.3
Vienna	8.7	11.1	16.3
	57.3	73.0	107.7

Table 79

Total current expenditure, vocational compulsory schools, 1963, 1970, 1975

	1963	1970	1975
Personnel expenditure	173.2	219.1	323.0
Non-personnel expenditure	57.3	73.0	107.7
Total current expenditure	230.5	292.1	430.7
of which:			
Federal expenditure	81.3	102.8	151.8
Provinces (with Vienna)	149.2	189.3	278.9

Capital expenditure

This will be projected separately at the end of this chapter.

B. General Secondary Education. (General Secondary School: includes here arts and science grammar schools and secondary schools for girls; but excludes the new grammar schools mainly for future teachers).

Introduction

In Austria the operation of public general secondary schools is a responsibility of the Federal Government and not of the provinces and municipalities. Besides these public schools, 15¼ per cent of all pupils in general secondary schools are attending private schools, the major part(1) of which is run by the Roman Catholic Church. Enrolment in private schools, as a percentage of total enrolments, showed a rapid increase from 10.4 in 1952/53 to 15.4 per cent in 1959/60 but remained constant in the five years since then. In 1964/65 there were only eleven, very small non-confessional private schools. Five of them will be taken over by the Federal Government in the course of the coming years whereas some of the others (such as the Theresianum in Vienna) receive substantial financial aid from the government and are regarded as belonging to the public sphere. Most of the teachers in these schools are in government service and as such fully paid by the state. In view of the small and declining importance of this non-confessional sector of private secondary education, the costs of these non-confessional schools will be ignored for the purposes of the cost projection; their present share in total enrolments will be regarded as taken over by the state.

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(1) As much as 81 per cent of the number of private schools and 84 of the number of pupils in private schools.
In Austria in 1964/65, 211 general secondary schools were counted (without secondary schools mainly for future teachers), of which 153 were public and 58 were private. Of the 58 private secondary schools 47 (81 per cent) were run by the Roman Catholic Church.

In accordance with the Treaty with the Holy See and the 1962 Education Act, the 47 confessional private schools receive state subsidies to the amount of 60 per cent of teachers' salaries. The major part of this is given in the form of "live subsidies", that means: state-paid teachers. In church circles it is expected that, with this aid, confessional schools will be able to maintain its proportionate share in total enrolments. For the purpose of our cost projection it is assumed that this share will remain constant at 13 per cent.

Table 80

General secondary schools, pupils and teachers

	1952/53		1955/56		1962/63		1963/64		1964/65	
	N	%	N	%	N	%	N	%	N	%
Pupils										
- Public	60,197	89.6	69,501	86.3	68,381	84.7	69,483	84.6	72,319	84.5
- Private	6,994	10.4	11,069	13.7	12,297	15.3	12,600	15.4	13,263	15.5
- Total	67,191	100	80,570	100	80,678	100	82,083	100	85,582	100
Teachers										
- Public			4,640		5,169		5,671		6,025	

Expenditure on general secondary schools

In the decade between 1953 and 1963 state expenditure (current) on general secondary schools developed as follows(1):

Table 81

State expenditure on general secondary schools

(In million Schillings)

	1953	1956	1963
Personnel expenditure	138.0	243.1	456.8
Other current expenditure	23.4	53.7	80.6
Total current expenditure	161.4	296.8	537.4
Revenue	14.5	19.4	8.2
Total net expenditure	146.9	277.4	529.2

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(1) Including the so-called "Bundeserziehungsanstalten".

Expenditure analysis and projection

Personnel expenditure

Generally speaking a careful analysis of past expenditure trends and a reliable estimate of future outlay is impossible without information about the number, hours of employment, qualifications, age structure and sex composition of the past, present and future teaching staff and about the way a change in these factors affects teachers' salaries (structure of salary scales).

Every Assessment of the number of teachers must take into consideration present numbers and past trends. For this purpose the following details are available: Teachers' quotas, which do not only include the number of "Federal Government Teachers" but those state paid teachers who work in private schools as so-called "live subsidies" (e.g. Theresianum, the Workshop school in Felbertal,etc.), as well as subsidised teachers'posts in denominational schools since 1962. They do not include teachers who are not publicly employed by the Federation (Bund) or by the provinces (Länder). It should be noted that the teacher quota cannot simply be compared with the numbers of teachers per capita as stated in the official "School Statistics". It thus happens that one teaching post may be occupied by several teachers, i.e.,some teachers are part-time. On the other hand six teaching posts may be occupied by five teachers, all of whom put in overtime. Solutions of this kind are unavoidable in times of teacher shortage. Double countings also cannot be avoided becsuse such teachers often teach part-time at other schools after official school hours. The present age structure and sex composition of the teaching staff is known but no reliable guide lines can be laid down for the assessment of future changes. It had to be assumed that the number of teachers will increase in the same proportion as the number of pupils, in other words, that the pupil/teacher ratio, which is considered satisfactory, will remain the same.

Total personnel expenditure on general secondary schools by the Federal Government rose from Schillings 243.1 million in 1956 to Schillings 456.8 million in 1963 or by 88 per cent. The nominal number of teachers increased in the same period from 4,711 to 5,336(1) or by 13 per cent, which leaves an increase in average outlay per teacher of 66 per cent.

The projection of future personnel expenditure (in constant 1963 prices, ignoring the inflation factor) given below, rests on the two major assumptions:

(a) That the number of teachers will follow, proportionately, the number of pupils;

(b) That average real outlay per teacher will follow, proportionately, the expected increase in gross national product per head of the employed population.

It is, moreover, assumed that these two factors are the only determinants of personnel expenditure and that the other factors, mentioned above (full-time/part-time, age structure, etc.) will have no influence, or a mutually compensating influence on the level of expenditure.

On the basis of these assumptions the following calculations can be made.

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(1) To convert school years into calendar years two-thirds of an old school year and one-third of the following new school year were taken to form a calendar year.

Table 82

Personnel expenditure, general secondary schools

(a) Expected number of pupils in general secondary schools.

	1963/64	1965/66	1970/71	1975/76
Number of pupils[1]	82,083	93,888	117,606	156,575
Index	100	114	143	191

(b) Expected increase in gross national product per capita, in constant 1954 prices (Annex to Chapter III, Table 47).

	1963[2]	1965	1970	1975
Gross national product per capita (Schillings '000)	40.5	44	55	68
Index	100	109	136	168

The combination of (a) and (b) gives the following result, when applied to actual personnel expenditure in 1963:

	1963	1965	1970	1975
Index (a) x (b)	100	124.3	194.5	320.9
Personnel expenditure (Million Schillings)	456.8	567.8	888.5	1,465.9

(1) These numbers include, of course, pupils in private schools, the teachers of which are only partly paid by the state. Since the share of private schools in total enrolment (13 per cent) is assumed to be constant and subsidy policy is not expected to change, this complication cannot affect our index.

(2) 1963 figure from preliminary report to this project by Dr. Steindl.

Other current expenditure

As can be seen from Table 81 in this annex, this group of cost items developed rather erratically during the last decade. It was more than doubled in the three years between 1953 and 1956 but increased by only 50 per cent in the seven years since then. Expressed as a percentage of all current expenditure it increased from 14.5 per cent to 18.1 per cent and then dropped to 15.0 per cent. These percentages cannot serve as a guide for future projections since they change too much.

It is officially admitted that in the material sphere there are many arrears. This is confirmed by the fact that the percentage of 15 per cent is very low by international standards (normally some 20 per cent).

We have assumed that this percentage will gradually increase to 16 per cent in 1965, to 18 per cent in 1970 and 20 per cent in 1975.

This increase would result in the following rise in actual expenditure (in constant 1963 prices).

	1963	1965	1970	1975
Other current expenditure (Million Schillings)	80.6	108.2	195.0	366.5

Total current expenditure

The above estimates result in the following total current expenditure projections:

Table 83

Total current expenditure, general secondary schools

	1963	%	1965	%	1970	%	1975	%
Personnel expenditure	456.8	(85)	567.8	(84)	888.5	(82)	1,465.9	(80)
Other current expenditure . .	80.6	(15)	108.2	(16)	195.0	(18)	366.5	(20)
Total current expenditure . .	537.4	(100)	676.0	(100)	1,083.5	(100)	1,832.4	(100)
Trend (1963 = 100)	100		126		202		341	

C. Intermediate and Secondary Commercial Schools

This group includes the secondary business academies and the intermediate commercial schools.

The development in this sector of the educational system is shown in Table 84.

The share of Federal schools in total commercial school enrolments is still rather small, but gradually (in the last ten years even rapidly) increasing as a result of a policy of "Verstaatlichung", i.e., the taking over by the Federal Government of a number of private commercial schools, which were already fully or partly dependent on Federal subsidies. This policy can be expected to be continued in the future but the speed of this process is unknown, which makes financial projections rather difficult.

Financing

Federal schools are fully financed by the Federal Government. Confessional private schools receive the normal statutory subsidy of 60 per cent of their teachers' salaries. The great group of non-confessional private schools (e.g. those belonging to the Chambers of Commerce) are not legally entitled to receive any Federal help; they are known, however, to receive substantial aid such as the service of publicly employed teachers and it is assumed

Table 84

Intermediate and secondary commercial schools, number of pupils

	1955/56	%	1962/63	%	1963/64	%	1964/65	%
Business academies								
Federal schools	2,460	(36)	2,938	(39)	2,739	(39)	3,265	(47)
Private schools	4,431	(64)	4,577	(61)	4,246	(61)	3,693	(53)
Total	6,891	(100)	7,515	(100)	6,985	(100)	6,958	(100)
Commercial schools								
Federal schools	2,977	(27)	3,063	(28)	2,681	(28)	2,769	(33)
Private schools	7,989	(73)	7,896	(72)	6,897	(72)	5,699	(67)
Total	10,966	(100)	10,959	(100)	9,578	(100)	8,468	(100)

that the greater part of their personnel expenditure is covered by Federal Government expenditure. We have, consequently, assumed that the level of Federal Government personnel expenditure on commercial schools will not be greatly affected by the process of taking over private schools. Non-personnel expenditure by the Federal Government, however, will rise at a faster rate as the process of "Verstaatlichung" continues, since most of these expenditure items are normally borne by private schools without Federal aid.

Projection of future expenditure

Personnel expenditure

It is assumed that the number of teachers paid by the Federal Government will rise at the same rate as total enrolments in all commercial schools. (In other words it is assumed that the share of confessional private schools in total enrolments will remain proportionately the same and that the salary bill of the government will not be greatly affected by the "Verstaatlichung" of other private schools). Personnel expenditure amounted to Schillings 69.6 million in 1963 and can be expected to develop as follows:

Table 85

Personnel expenditure, intermediate and secondary commercial schools

	1963	1970	1975
1. Total enrolments in:			
Academies	6,985	11,553	14,659
Schools	9,578	13,210	18,350
Total	16,563	24,763	33,009
Trend (1963 = 100)	100	149.5	199.3
2. Gross national product per capita (1963 = 100)	100	136	168
3. Index (1) x (2)	100	203	335
4. Personnel expenditure (million Schillings)	69.6	141.3	233.2

Other current expenditure

This group of expenditure items cannot be projected with any precision since it will be greatly affected by the Federal Government policy of taking over private schools. This policy will no doubt result in a considerable increase in material expenditure by the Federal Government.

In 1963 the amount of non-personnel current expenditure on commercial schools was Schillings 10.8 million or 13.4 per cent of all current expenditure. To account for this expected increase of expenditure on former private schools, we have estimated this percentage to increase from 13.4 in 1963 to 17 in 1970 and 20 in 1975 but admit that this is pure guesswork. These percentages will result in the following nominal amounts:

	1963	1970	1975
Other current expenditure (million Schillings)	10.8	28.9	58.3

Table 86

Total current expenditure, intermediate and secondary commercial schools

(In million Schillings)

	1963	1970	1975
Personnel expenditure	69.6	141.3	233.2
Other current expenditure	10.8	28.9	58.3
Total current expenditure	80.4	170.2	291.5

D. Intermediate and Secondary Technical and Trade Schools

According to the Federal Act on Finance (Bundesfinanzgesetz) the term "Trade schools" embraces the following institutions:

- Secondary technical and trade schools.
- Intermediate trade, technical and arts-and-crafts schools as well as intermediate vocational schools for women's domestic and catering occupations, and intermediate vocational schools for social workers.
- Special variations of secondary and intermediate vocational schools.
- Schools for vocational-school teachers, and schools for higher social occupations.

The following is the method of the assessment

The total enrolment figures (total number of pupils attending the above-mentioned schools) in the academic years 1955/56, 1956/57, 1962/63 and 1963/64 were taken as the basis of the assessment, from which the average number of pupils per class has been found. With the help of this average and the figures of the "Second Assessment" the number of periods per week was calculated, to which 60 per cent of the periods to be taught in denominational private schools have been added. It has been assumed that the ratio (percentage) of teachers teaching in schools maintained by Federal provinces or the local communities but being paid by the Federal Government will remain unchanged. The same has been assumed in respect of other privately maintained schools. It can be seen by comparing the following enrolment figures that a considerable increase of costs has to be expected.

Table 87

Total enrolment of both private and public schools, technical and trade

	1955/56	1956/57	1962/63	1963/64
Intermediate and secondary vocational and technical schools	13,123	14,139	16,881	16,928
Intermediate and secondary schools for girls	10,595	10,236	9,011	9,033
	23,718	24,375	25,892	25,961

Table 88

Personnel expenditure, technical and trade schools (Federal Government)

	1963/64	1970/71	1975/76
Pupils, secondary, technical and trade schools	15,232	22,582	30,970
Intermediate vocational schools	4,084	6,058	8,302
Schools for vocational school teachers	149	230	250
Classes, secondary, technical and trade schools (forms). . . .	650	903	1,239
Intermediate vocational schools	218	275	377
Schools for vocational school teachers	10	9	9
Periods, secondary, technical and trade schools (hours) . . .	29,900	41,538	56,994
Intermediate vocational schools	7,630	9,625	13,195
Schools for vocational school teachers	350	315	315
	37,880	51,478	70,504
To be added:			
23.5 per cent of the pupils in intermediate vocational schools attend denominational schools 60 per cent of periods of these schools	2,122	3,003	4,116
	40,002	54,481	74,623

(Table 88 continued)

	1963/64	1970/71	1975/76
(a) Index/periods	100	136.2	186.6
(b) Index/gross national product	100	136	168
(a) x (b)	100	185.2	313.5
Personnel expenditure	226.3	419.1	709.4
Periods (to be paid by the Federal Government)	37,880	51,478	70,504
(a) Index	100	135.9	186.1
(b) Index/gross national product	100	136	168
(a) x (b)	100	184.8	312.6
Personnel expenditure (Federal Government)	214.3	396.0	669.9

Since other current expenditure amount only to 21.4 per cent of the total expenditure, it is necessary to increase this figure to 23.5 per cent (for 1970) and to 25 per cent (for 1975).

E. Teacher Training

1. Existing schools

This group of schools includes:

(a) The new grammar schools mainly for future teachers (replacing the old type of secondary-level teacher training school - see Chapter I, Section A4);

(b) Schools for training women teachers in domestic subjects;

(c) Schools for training kindergarten teachers;

(d) Schools for training educational assistants.

These school groups will be designated by these letters in the following tables.

As can be seen from the following table, the percentage share of private education in groups a, b and c, is quite substantial.

Table 89

Teaching training institutions - number of pupils

	1955/56	1956/57	1962/63	1963/64	%
(a) Federal schools	2,577	2,691	4,194	5,130	63
Private schools	1,435	1,453	2,771	2,995	37(1)
Total	4,012	4,144	6,965	8,125	100
(b) Federal schools	135	152	142	239	44
Private schools	128	146	217	298	56(1)
Total	263	298	359	537	100
(c) Federal schools	300	400	358	432	34
Private schools(2)	430	430	663	846	66(3)
Total	730	830	1,021	1,278	100
(d) Federal schools	-	-	-	60	61
Private schools(2)	-	-	-	38	39(4)
Total	-	-	-	98	100

(1) These are all confessional schools.

(2) Private schools include province and municipal schools.

(3) Of these 66 per cent about 51 per cent are confessional schools and 15 per cent province and municipal schools.

(4) No confessional schools; this figure represents one school of the municipality of Vienna.

System of financing

Federal schools are fully paid by the Federal Government; province and municipal schools are fully financed by these authorities without aid from the central government. Confessional schools receive a subsidy from the Federal Government amounting to 60 per cent of teachers' salaries.

Table 90

Enrolment projections, teacher training

	1963/64	1970/71	1975/76
School groups			
(a) Number of pupils (public & private)	8,125	12,824	17,015 (33% confessional)
(b) " " " " " "	537	938	1,077 (56% ")
(c) " " " " " "	1,278	1,526	1,764(1)
(d) " " " " " "	98	162	202 (40% municipal, no confessional)
Total	10,038	15,450	20,058
Trend (1963/64 = 100)	100	154	200

(1) Of which 51 per cent in confessional schools and 14 per cent in schools of the provinces and municipalities.

This group of schools is far from homogeneous; the participation of private and municipal authorities differs greatly. Number of hours taught, qualifications of teachers and consequently also the average costs are not the same in a,b,c and d. As financial data for each of these groups separately could not be obtained it was impossible to make a financial analysis for each and to calculate the difference in unit costs between a,b,c and d.

For the purpose of the cost projection, the above-mentioned enrolment figures for Federal schools plus 60 per cent of the confessional schools were converted into numbers of classes and these into numbers of weekly teaching hours; the latter, in turn were regarded as an index of the number of teachers.

Table 91

Number of teaching hours per week, teacher training schools

	1963/64	1970/71	1975/76
Federal schools (a)	5,495	9,310	12,460
(b)	333	447	481
(c)	495	891	1,023
(d)	126	168	210
Total	6,449	10,816	14,174
Confessional schools (60%) (a)	1,911	2,814	3,696
(b)	244	377	444
(c)	444	673	792
(d)	-	-	-
Total	2,599	3,864	4,932
Grand total	9,048	14,680	19,106
Trend (1963/64 = 100)	100	162	211

Projection of public expenditure

(i) Personnel expenditure

Personnel expenditure on this group of teacher training schools by the Federal Government(1) amounted to Sch.48.9 in 1963; it can be projected as follows:

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(1) No data about the expenditure by the provinces and municipalities could be found; this expenditure is included in "unspecified expenditure" treated in sub-section (g) below.

Table 92

Personnel expenditure, teacher training schools

	1963	1970	1975
1. Trend in number of hours (1963 = 100)	100	162	211
2. Index gross national product per capita (1963 = 100) . . .	100	136	168
3. Index (1) x (2)	100	220	354.5
4. Personnel expenditure (million schillings)	48.9	107.6	173.4

(ii) Other current expenditure

This group of expenditure items amounted to Sch.11.1 million in 1963.

Since subsidies to private confessional schools are given for salaries only, and not for material expenses, this amount can be assumed to be in respect of Federal schools only and should, consequently, be compared with personnel expenditure on Federal schools only. On the basis of the number of hours, given above, personnel expenditure on Federal schools can be estimated at 6,449 : 9,048 x Sch. 48.9 = Sch. 34.9. Together with other current expenditure, total current expenditure on Federal schools would thus amount to Sch. 34.9 + Sch. 11.1 = Sch. 46.0.

Expressed as a percentage of the latter figure, other current expenditure amounts to 24 per cent. Since this percentage can be considered normal, we have assumed that it will remain constant, in other words: that it will rise at the same rate as personnel expenditure for Federal schools. This can be calculated as follows:

Table 93

Other current expenditure, teacher training schools

	1963	1970	1975
1. Number of hours (Federal schools)	6,449	10,816	14,174
Index (1963 = 100)	100	168	220
2. Index gross national product per capita	100	136	168
3. Index (1) x (2)	100	228.5	369.6
4. Other current expenditure (million schillings)	11.1	25.4	41.0

(iii) Total current expenditure

Table 94

Total current expenditure, teachers training schools

	1963	1970	1975
Personnel expenditure	48.9	107.6	173.4
Other current expenditure	11.1	25.4	41.0
Total current expenditure	60.0	133.0	214.4

2. The new teacher-training colleges

These colleges will commence their work on an experimental basis at the beginning of the academic year 1966/67; according to the School Organisation Act 1962 these colleges must be established not later than 1st September, 1968.

All financial matters, i.e., expenditure for personnel as well as other current expenditure, have not yet been agreed upon by the Ministry of Finance, and therefore are only hypothetical.

It is highly probable that 8 colleges will be established by the Federal Government and 6 colleges by denominational bodies (the Catholic Church), one will be maintained by both parties. 4,000 students will attend these colleges, 33 per cent of them will attend the Catholic establishments.

The existing provisional teaching staff is as follows:

Table 95

The new teacher-training colleges, salaries, staff expenditure, provisional figures, 1965

	Federal colleges			Denominational colleges	
	Salaries per annum	Number of staff	Expenditure	Number of staff	Expenditure
Director	139,650	9	1,256,850	6	837,900
Professors	111,720	64	7,150,080	30	3,351,600
Head of Department	105,000	9	945,000	6	630,000
Teachers L_1	84,000	353	29,652,000	184	15,456,000
			39,003,930		20,275,500
Overtime expenditure			1,170,118		608,265
Travelling allowances awards 1%			390,039		20,883,765
					of which 60%
22 typists each 43,400			954,800		12,530,026
			41,518,887		
Private schools			12,530,026		
			54,048,913		

Table 96

The new teacher training colleges, projected expenditure

	1963	1970	1975
Index/students		100	100
Index/gross national product	100	136	168
Personnel expenditure	54.04	73.5	90.8
Other current expenditure (30 per cent of the current expenditure of public and private schools)	23.16	31.50	38.91
Student grants	32.00	43.52	53.76
Total expenditure	109.20	148.5	183.4

In addition to it (according to information from Dr. Loicht and S.R. Dr. Reysach)

Table 97

The new teacher training colleges, building costs

(including fences, recreation grounds, etc.) from Sch.1.000 to Sch.1.200 per m^3)

(This does not include the cost of the land)

Examples

	Students	Pupils in practice schools	m^3	Building expenditure in million schillings	Without land
Vienna	300	800	79,000	95	"
Salzburg	240	360	46,000	55	"
Feldkirch	220	360	46,000	55	"

It is assumed that all college buildings will be completed by 1970.

8 x 55 million = 440
1 x 95 " = 95
535 million

F. Higher Education

Introduction

A summary of some vital statistics about the development of the Austrian universities and art academies is given in the figures below. The number of students showed a rapid increase (especially at the universities) in barely ten years, to two and a half times the number of 1955/56. The number of foreign students showed a relative decline but was still nearly 20 per cent of the total number in 1964/65.

In contrast, the teaching staff at the universities increased only slightly and, as a result, the student/staff ratio showed a very rapid deterioration, which was restricted however to the universities. In fact, the student/staff ratio at the universities more than doubled between 1955 and 1963 and showed only a slight improvement in 1964. Not to be seen from our figures, but nonetheless equally true, is that the provision of facilities at the universities in the form of space and equipment showed an equal or even more rapid deterioration.

Table 98

Higher education, students, teaching staff

	1955/56	1956/57	1962/63	1963/64	1964/65	% increase
All students:						
Universities	19,486	21,139	46,425	47,817	48,877	151
Art academies	1,607	1,711	1,915	2,439	2,592	61
Total	21,093	22,850	48,340	50,256	51,469	144
of which foreign students	21.6%	26.8%	23.3%	20.7%	19.5%	
Teaching staff:						
Universities	3,110	3,175	3,615	3,659	3,960	27
Art academies	334	342	472	587	-	
Total	3,444	3,517	4,087	4,246	-	
Student/staff ratio:						
Universities	6.27	6.66	12.84	13.07	12.37	
Art academies	4.81	5.00	4.06	4.16	-	
Total	6.12	6.50	11.83	11.84	-	

Expenditure on higher education

In spite of the fact that the development of higher education in Austria gradually resulted in what the Education Survey 1965 of the Ministry of Education(1) does not hesitate to call "a crisis situation .... which grew even more critical than it was already ten years ago", public expenditure on universities showed a rapid increase between 1956 and 1965. Gross expenditure, although far below that of other countries,(2) for the universities (excluding art academies) rose from Sch. 263.4 million in 1956 to Sch. 641.6 million in 1963 and Sch.1,041.8 million in 1965 or from 12 per cent of the total budget in 1956 to 16 per cent in 1963 and 20 per cent in 1965.

Further analysis of these figures, however, reveals that only part of this increase was spent on the direct provision of educational facilities (teachers' salaries, investment in equipment and materials) and that by far the greatest increases were recorded in social expenditure, and a number of transfer items as listed in the table below:

Table 99

Scholarships, students' homes, other social measures, subsidies to clinics

	1956	1963	1965	% increase
Scholarships	1.8	26.0	112.5	5,250
Students' homes	2.0	28.7	35.0	1,650
Other aid to students	-	0.8	5.8	-
Subsidies to clinics	22.8	123.7	225.0	887
Total (in million Schillings)	26.6	179.2	378.3	1,322

Expenditure on these indirect items increased more than fourteenfold from 4 per cent to 36 per cent of total expenditure on universities. It is interesting to note that since the new law on students' aid came into force (1963) and the Federal Government's expenditure on scholarships started to rise to its present level, the scholarship programmes of the regional and local authorities and of religious and other private bodies (some Sch. 15-20 million) were discontinued or greatly reduced.(3)

Expenditure on salaries, other current expenditure (maintenance,etc.) and investments in equipment and materials increased far less and dropped, consequently, from 96 per cent of total expenditure on universities in 1956 to 64 per cent in 1965.

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(1) Bildungsbericht 1965, page 174.

(2) See figures given on page 180 of the Bildungsbericht, 1965.

(3) Bildungsbericht 1965, page 147.

Table 100

Expenditure, higher education, 1956, 1963, 1965

	1956	1963	1965	% increase
Personnel expenditure	155.5	272.6	401.5	158
Other current expenditure	56.0	135.6	182.2	225
Investment in equipment	25.2	54.2	79.7	215
Total	236.7	462.4	663.4	180

Summarising: the total amount of funds available for higher education quadrupled between 1956 and 1965; there was, however, also a re-direction of funds away from direct provision of educational facilities towards more indirect expenditure items: social and other transfers.

Cost projection

In the absence of a comprehensive plan for the development of higher education in Austria, and due to the lack of opportunities to make a thorough analysis of the costs of the universities, our projections can only be very global while based on the crudest assumptions.

Since expenditure on higher education in Austria showed an exceptionally rapid increase between 1963 and 1965, we did not take 1963 as our base year because this would have led to very low cost estimates, but based ourselves on the budget figures for 1965 which seemed more realistic. To arrive at "constant 1963 prices" we deflated the 1965 figures by the rise in the general price level that occurred between July 1963 and July 1965 (11.4 per cent).

Table 101

Total public expenditure on higher education (including art academies) 1965

(In million Schillings)

	Universities	Art academies	Total	
			In 1965 prices	In 1963 prices
Personnel expenditure	401.5	38.3	439.8	394.8
Students' aid	118.3	8.0	126.3	113.4
Investment in equipment	79.7	7.0	86.7	77.8
Investment in students' homes	35.0	3.4	38.4	34.5
Clinics: Capital expenditure	125.0	-	125.0	112.2
Other expenditure	100.0	-	100.0	89.8
Other current expenditure	182.2	35.2	217.4	195.1
Total gross expenditure	1,041.7	91.9	1,133.6	1,017.6
Revenue	64.4	9.3	73.7	66.2
Total net expenditure	977.3	82.6	1,059.9	951.4

(i) Personnel expenditure

As for the other levels of education we have assumed that the salaries of the university staff will rise at the same rate as gross national product per capita.

The number of staff is, of course, partly dependent on the number of students. Available enrolment projections (BG 814/2 - 2. Schätzung - table 4) refer to "ordinary Austrian students", which excludes foreign and extraordinary students.(1) We have assumed that the proportion of the latter in total enrolments will remain the same so that the future trend in ordinary Austrian students can be regarded as an index of the total number of future students enrolled in Austrian universities and art academies.

In contrast to our methods used for the other levels of education we have not assumed that the student/staff ratio would remain constant. In view of the serious deterioration in the staff position of the universities this method would have been very pessimistic. It is assumed, instead, that steps will be taken to increase the number of staff in relation to the number of students at least to the level of 1955. This means a decrease of the student/staff ratio from about 11 at present, to, say, 8.5 in 1970 and 6 in 1975. In view of the heterogeneous nature of the university staff a projection that does not take into account the composition of the staff (professors and other teaching staff, assistants and other scientific staff, non-scientific staff), is not very satisfactory. Work in this field is undertaken by the Ministry, but since the results were not yet available we had to leave this factor out of our calculation. On the basis of these above assumptions, personnel expenditure was projected as shown in the table below.

Table 102

Personnel expenditure, higher education

	1965	1970	1975
1. Number of ordinary Austrian students	39,186	43,622	49,794
Index (1965 = 100)	100	111.3	127.1
2. Student/staff ratio	11	8.5	6
3. Index number of staff (index 1 x 2)	100	144	233
4. Gross national product per capita (Dr. Steindl)	44	55	68
Index (1965 = 100)	100	125	154.5
5. Index 3 x 4.	100	180	360
6. Personnel expenditure (million Schillings)	394.8	710.6	1,421.3

(ii) Other current expenditure

Leaving aside for the moment students' aid and other transfers and capital items, it is interesting to note that the remaining group of current expenditure increased from less than one-third of personnel expenditure in 1956 to one-half in 1965. This increase in the relative importance of the group is no doubt a reflection of the rapid decrease in the number of staff per student. When the staff position is greatly improved again, as suggested in the previous paragraph, we expect this percentage to drop again in one-third of personnel expenditure.

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(1) These groups of students were included in our figures on the first page of this appendix, which explains the difference in enrolment levels.

	1965	1970	1975
Ratio to personnel expenditure	1/2	3/7	1/3
Other current expenditure (million Schillings)	195.1(1)	304.5	473.8

(iii) Students' aid, other transfers, investment in equipment

Our estimate of these expenditure items is pure guesswork since a proper basis for making projections was lacking. It would have been more honest, perhaps, to leave these items out altogether. It was our aim, however, to arrive at a projection of the total budget, comparable with past and present total expenditure figures. We made a very global estimate, therefore, of what the future magnitude of these items could be but do not want to attach too much importance to them and hope there will be a future possibility to revise them in the light of more precise information.

It is assumed that the problem of creating more places at the universities and attracting more staff will receive relatively more emphasis during the coming decade than aid to students and other transfers. We have assumed that students' aid will go up at the same rate as the increase in the number of students and in gross national product per capita combined. This is an increase by 96 per cent over 10 years of from Sch.113.4 million in 1965 (in prices of 1963) to Sch. 222.3 million in 1975. We estimated that expenditure on clinics and capital expenditure on equipment will roughly double. Investment grants for students' homes were assumed to triple in view of the great arrears that exist in this field.

No big increase is foreseen in revenue.

(iv) Total current expenditure, higher education

Table 103

(In million Schillings)

	1965(1)	1970	1975
Personnel expenditure	394.8	710.6	1,421.3
Students' aid	113.4	157.6	222.3
Investment students' homes	34.5	70.0	100.0
Investment in equipment	77.8	115.0	155.0
Clinics - capital expenditure	112.2	170.0	225.0
Clinics - other expenditure	89.8	135.0	180.0
Other current expenditure	195.1	304.5	473.8
Total gross expenditure	1,017.6	1,662.7	2,777.4
Revenue	66.2	75.0	90.0
Total net expenditure	951.4	1,587.7	2,687.4

(1) In prices of 1963.

6. Unspecified School Expenditure of the Provinces and Municipalities

A difficulty for the analysis and projection of educational expenditure is that the financial statistics of the provinces and municipalities give only a partial breakdown of total expenditure on schools into types and levels of education; consequently part of the expenditure remains unspecified:

Table 104

School expenditures and revenue, provinces and municipalities

(In million Schillings)

	Ordinary expenditure			Ordinary revenue	Extraordinary expenditure
	Personnel	Material	Total		
Provinces (without Vienna) 1963					
Total	28.5	230.3	258.8	50.2	63.5
Of which:					
General compulsory schools	2.8	31.3	34.1	12.2	10.5
Vocational compulsory schools	9.2	123.7	132.9	24.3	47.8
Technical schools	9.2	12.3	21.5	-	2.3
Total specified	21.2	167.3	188.5	36.5	60.6
Remainder unspecified	7.3	63.0	70.3	13.9	2.9
Municipalities (with Vienna)					
Total	142.9	839.7	982.6	127.9	486.9
Of which:					
General compulsory schools	106.8	685.8 (2)	792.6	96.6	420.7
Vocational compulsory schools (Vienna) (1)	10.5	49.6 (3)	60.1	1.2	-
Total specified	117.3	735.4	852.7	97.8	420.7
Remainder unspecified	25.6	104.3	129.9	30.1	66.2
Schulgemeindeverbände					
Total unspecified	13.4	69.7	83.1	36.0	59.4

(1) These figures were obtained separately from the financial accounts of Vienna.

(2) Including Sch. 53.6 million capital expenditure of Vienna.

(3) Including Sch. 18.3 million capital expenditure.

We have assumed that the unspecified expenditure of the regional and local authorities is for the remaining group of schools for which they are partly responsible: the secondary commercial and technical schools and the teacher training institutes. To make at least a rough estimate of the future development of this group of expenditure items, we have further assumed that the financial contribution of the provinces and municipalities will rise at the same rate as Federal expenditure on the same schools:

Table 105

Expenditure of Federal Government

	1963	1970	1975
Secondary commercial schools	80.3	170.2	291.5
Secondary technical schools	281.7	540.7	932.7
Teacher training	59.4	133.0	214.4
Total	421.4	843.9	1,438.6
Trend	100	200	341

Net current unspecified expenditure of

Provinces (without Vienna)	77.9(1)	155.8	265.6
Municipalities (+ - Verbände)	146.9	293.8	500.9

(1) Including technical schools.

H. Capital Expenditure

Introduction

Information about the precise level of capital expenditure, especially that part which is spent on new construction, was either lacking or not very precise. It was very difficult to compare these financial data with the actual number of new school buildings and classrooms or with changes in the stock. Consequently, the available figures on the past and present level of capital expenditure do not tell us much about future capital requirements.

A different method was used instead which only allows us to make a very global estimate of future capital requirements.

For the compulsory schools Dr. Schlesinger provided us with a list of the planned construction of new classrooms, of the planned renovations and alterations and of the classroom deficit that would still exist in 1975 after implementing these plans. He gave us also an indication of the present price of a new classroom.

For the various types of secondary schools, we made use of Dr. Loicht's quantitative study of classroom requirements up to the year 1974/75. His study contained figures about the present stock and future need for classrooms. The difference between these two data and the present price of one classroom mentioned in his report formed the basis of our calculation of total capital requirements. In addition, we estimated replacement demand to be 2 per cent annually, or 20 per cent over the period 1965/1975, half of which in the form of new construction, half in the form of renovations at 10 per cent of the price of a new classroom.

Additional information about the costs of building the new-type teacher training colleges and about the building programme for the universities was obtained from the Ministry of Education.

Table 106

Capital expenditure of the provinces and municipalities
General compulsory schools

(a) Planned new constructions: 5,542 new classrooms at Sch.1,000,000 per room	= 5,542 million Schillings
(b) Planned renovations, alterations, etc.: 1,820 classrooms at Sch.100,000 per room	= 182 million Schillings
(c) Foreseeable shortage in 1975: 2,403 classrooms at Sch.1,000,000 per room	= 2,403 million Schillings
Total	= 8,127 million Schillings

Contrary to these figures, Mr. Schlesinger himself did not expect capital expenditure to be so high. Construction costs and building standards in other parts of the country might be lower than in Vienna and it was considered unrealistic to expect that construction would expand so rapidly that the shortage mentioned under (c) would have disappeared before 1975. Apart from limits set by the capacity of the building industry, one does not plan to build for what might be a peak in the number of students but for normal numbers after 1975. Consequently, Mr. Schlesinger reduced the above estimate to Sch.5,100 million.

On the other hand, the above calculation does not include capital expenditure on the vocational compulsory school(1) nor on the other schools of the provinces and municipalities.

Our guess is that the total amount of investments in schools of the provinces and municipalities during the ten-year period, 1965-1975, will be some Sch.7,000 million. Starting from the estimated present amount of capital expenditure of some Sch.600 million (1965), this amount would have to be gradually increased to Sch.700 million in 1970 and Sch. 800 million in 1975 to reach this total amount over the whole of the period.

Capital expenditure of the Federal Government

Dr. Loicht's report enabled us to make the following calculation (figures in columns 1, 2 and 7 are derived from his report).

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(1) Here the expansion of the number of classes is 725; at a cost of Sch.1.3 million per classroom, this means an additional investment of nearly Sch.1,000 million.

Table 107

Required classrooms, number and cost

	Classrooms							
	Required 1974/75	Stock 1964/65	Expansion demand	Replacement		Total demand	Price per room	Total amount
				10% new	10% renovation (1)			
General secondary . .	4,394	2,144	2,250	214	21.4	2,485.4	1.2	2,982.5
Commercial	405	172	233	17	1.7	251.7	1.2	302.0
Technical	1,078	519	559	52	5.2	616.2	3.1	1,910.2
Vocational schools for women	280	154	126	15	1.5	142.5	1.8	256.5
Teacher training . .	477	184	293	18	1.8	312.8	1.2	375.4
Special forms	142	89	53	9	0.9	62.9	3.1	195.0
New teacher training colleges: according to the Ministry of Education the large colleges in Vienna will cost Sch.95 million, the eight others are smaller (± Sch.55 million):								535.0
Total expenditure (in million Schillings)								6,556.6

(1) At 10 per cent of the cost of a new classroom (numbers divided by ten).

The present amount of investment in new schools (excluding universities) is some Sch. 500 million (1965). To reach the total amount shown above, annual capital expenditure would have to be increased to Sch.650 million in 1970 and Sch.800 million in 1975.

According to information received from the Ministry of Commerce, investments in the sector of higher education is at present Sch.79.5 million and expected to rise to Sch.100 million in 1970 and Sch.120 million in 1975.

Total investment in schools of the Federal Government and in universities can, therefore, be expected to amount to Sch.750 million in 1970 and Sch.920 million in 1975. To allow for other educational investments than those in schools (administration, inspection, educational research) we have increased the last figure to Sch.1,000 million.

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